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THE CENTENARY OF THE GENERAL MEDICAL COUNCIL

BY

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The Medical Act of 1858 established as the chief agent of long overdue reform the General Council of Medical Education and Registration of the United Kingdom, referred to from its earliest days as the General Medical Council, a title officially adopted in 1951. The centenary of the Council's first session falls on November 23, a date which should be memorable in the annals of British medicine as marking the first practical step towards the united and well-organized profession of to-day.

Background of the Act of 1858

It is a curious paradox that a century dominated by the slogans of *laissez-faire* and rugged individualism should have produced legislation which regulates our life, both as individuals and as groups, in so many ways. It is another paradox that the decades of agitation for medical reform, carried on by enlightened medical men in the face of much public indifference, produced an Act to regulate and discipline the profession itself rather than to ban the activities of the thousands of untrained and irregular practitioners who battened on society. One historian of these events (Rivington, 1879) complained bitterly that this was done for the sake of the liberty of the subject, who should not be hindered in his choice of doctor, qualified or unqualified. "Freedom of choice" has a strange ring in such a context, but time has proved the wisdom of the Government of the day in promoting legislation *for* the profession rather than simple punitive measures *against* quacks.

The declared purpose of the Act was to enable the public to distinguish qualified from unqualified practitioners. In that same year Tennyson expressed the hope which inspired this declaration when he wrote, "We needs must love the highest when we see it." But what was the "highest"? When the profession quarrelled so openly about the status of the orders within its hierarchy the public could be excused for being bewildered. Until the General Medical Council was enabled, with the co-operation of the various examining and professional bodies, to undertake its difficult task of reformation—and at first it had to move very circumspectly—the nation was presented with the spectacle of a profession in chaos, unable to achieve order and agreement within its own ranks, split from top to bottom by jealous rivalries and competing interests, with all the ways to internal reform blocked by ancient privileges stubbornly preserved. The centuries-old division between physicians and surgeons and, later, the feud between physicians and apothecaries provide material for the more sombre chapters in the history of the profession in Britain.

A profession cannot be created by Acts of Parliament, as was proved by the first Medical Act of 1511–12, which was unenforceable for the simple reason that there were not enough regularly qualified physicians and surgeons in the country. With about one qualified man to 25,000 of the population the quacks were bound to flourish. For 350 years they often went scot-free while the licensing corporations wielded their powers—not wisely but too well—against men who had been regularly trained outside their ivory towers, the quality of such competition being much more dangerous. Without any support from the corporations which should have encouraged them the body of general practitioners developed from the humbler surgeons and the lowly apothecaries, originally mere compounders and dispensers of drugs. Men of ability and integrity by the standards of their own time, they were responsible for supplying the medical needs of the ordinary people up and down the country (see Bishop, 1952).

The Act of 1815, by which apothecaries gained the legal sanction to practise medicine, was the first triumph for the reforming spirit which was clearly at work among them even in the first decade of the nineteenth century. "Liberty, Equality, Fraternity" was the slogan of a nation with whom we were at war, but to many Englishmen it was none the worse for that. Less than 20 years later, in 1832, the very year of the great Reform Bill, the apothecaries banded themselves together for corporate action in the Provincial Medical and Surgical Association under the earnest and skilful leadership of Charles Hastings, of Worcester. One of the chief objects of the new association—which changed its name in 1855 to the British Medical Association—became clear in 1837, when a Medical Reform Committee was established. Before success crowned its efforts no fewer than 17 reforming Bills had been rejected by Parliament, most of them aborted by the refusal of other medical bodies to compromise with the spirit of the age.

What the reformers hoped to achieve by the Act was the purging from their ranks of unqualified practitioners, the removal of antiquated local prohibitions from the practice of regularly qualified practitioners, wherever they may have qualified, and a greater uniformity in qualifying examinations so that the graduates of "diploma mills," some of them little or no better than the quacks, could be gradually eliminated. Their ultimate purpose was to raise the status and attainments of the medical practitioner until he was worthy of the dignity of a noble profession.

But politics is the art of achieving the possible, and after its first enthusiastic reception the Act disappointed many of the most ardent reformers. Politicians and the

public generally were not ready to condemn the unqualified as totally beyond the pale, and the restrictions of legal registration to those qualified by examination was as far as they were prepared to go. In a brilliant memorandum on the subject to the General Board of Health John Simon (1869) pointed out that the Act would not achieve its object unless the "*legally qualified* medical practitioner shall be a *well-qualified* practitioner."

The Council and its Functions

From its very beginning, then, the General Council was well aware that its chief duty was to establish and ensure proper educational standards for the profession. Its other duties were to compile and publish annually the register of qualified practitioners, admitting to it only the names of those whose education was deemed sufficient and removing from it, as occasion demanded, the names of those guilty of criminal offences or of serious professional misconduct. In addition, it was to be responsible for the publication of a national pharmacopoeia.

In essence, these duties were simple enough, but the powers of the Council were so vaguely indicated in the Act that every advance towards its goal had to be carefully prepared by long and sometimes heated discussions and by amending legislation. It faced this prospect in a manner which a later president characterized as tentative, hesitant, and half-unconscious (MacAlister, 1906). But if we recall certain historical facts we may understand better why this was so. Constitutionally, the Council was the first statutory tribunal of its kind with quasi-judicial powers over a whole profession. It is the nature of English law that it is developed by interpretation and precedent in the Courts, and until the Medical Act had been through this process its precise implications were unknown. Even the first members of the Council were in doubt about the nature of their corporate powers. The Council was not "our Medical Parliament," as even Sir Robert Christison, one of their number, called it in 1859 (Christison, 1886). Its legally defined purpose was to safeguard the public interest in certain ways and not to advance the welfare of the profession.

When put to the test the Act was found to be defective in many ways. The composition of the Council left the reformers in no doubt that it fell short of their demands, for the old corporations were present in strength while the profession at large had not a single direct representative. Nor did they consider that educational reform would be achieved very rapidly by a body which represented chiefly the existing and still fiercely competing licensing bodies. There were individual councillors for each of the nine medical corporations, for each of the four English and the two Irish universities, while the four Scottish universities had two between them, their number being completed by six Crown nominees and a president elected from outside their number. Only the nine corporation members were required by the Act to be registered medical practitioners; both the Crown and the universities could elect laymen.

Among the councillors who attended the first session in the Royal College of Physicians were some whose names are now part of our medical history; Acland, Christison, Clark, Corrigan, Green, Hastings (as a Crown nominee), Lawrence, Stokes, Syme, and Watson. On Acland's proposal, the beloved and widely respected Sir Benjamin Brodie, an old man of 75 already threatened with blindness, was elected the Council's first President. They set out to perform their duties as required by Parliament. Acland was so clear in his own mind about their nature that he had suggested that the Crown should appoint experienced and well-informed lay members of the House of Lords, such as Lord Shaftesbury, who would strengthen the administrative efficiency of the Council, correct its professional bias, and be in a position to promote measures of medical importance in Parliament. It is interesting to note that, clear-sighted as he was in most things, he did not anticipate the day when men who had been raised to the peerage for their professional eminence and scientific distinction would sit as medical members of the Council. From 1926 onwards it was the practice for one of the five members nominated by the Crown to be a layman. The Act of 1950 increased the number of nominees to eight but laid down that three of them should be laymen.

Less than six weeks after its first meeting, the first issue of the *Medical Register* was due to be published. Thousands of applications were received in the last few days of December, and amending legislation had to defer publication until July, 1859. Taking the country as a whole, there was by now one medical practitioner for approximately 2,000 people, but only two in three were qualified. The first *Register* contained nearly 15,000 names, including some who, although unqualified, had been in practice in 1815 and were therefore allowed to register. Within 50 years the number grew to 40,000, and it enters its centenary year with a roll of 90,000.

Disciplinary Powers

The *Register* was welcomed by the reform movement as a valuable aid to its activities. Medical registration associations were formed on a local basis and prosecutions were brought against offenders, at first with disconcerting results, those who brought the charges being inadequately briefed on the loopholes in the law. This fact increased the disillusionment of general practitioners, who saw the Council merely as a private club for the powers of privilege from which they were excluded. True, they blamed the Council for not doing what it had no power to do, but in those first decades it was by no means a united club, and to some at least of its members "the inevitability of gradualness" was an attractive policy long before it was revealed to the Fabians. But there were too many forces at work for the overcautious to hold the reins for ever.

The clarification of the Act achieved in the courts gave the Council a clearer idea of its powers and responsibilities. A ruling from the Lord Chief Justice in 1863 stated that there was no legal appeal against the decisions of the Council and only one sentence possible if guilty—erasure from the *Register*. In 1894 came a progressive ruling which defined the phrase "Infamous conduct in a professional respect." This was interpreted as "that which could reasonably be regarded as disgraceful and dishonourable by [one's] professional brethren of good repute and competency." As ethical and educational standards have improved, the level of conduct likely to be so regarded has also been raised, so that many practices considered normal 50 years ago would not now be tolerated.

Reluctant as was the Council to censure or punish severely fellow members of the profession, it was carried along by the main stream of progressive opinion. Being uncertain of its powers to restore to the *Register* a name which had once been erased, it used its disciplinary powers hesitantly until a sound legal opinion in 1882 convinced it that a reformed offender could safely be reinstated, although in fact statutory power to do so was given only by the Medical Act of 1950. Reinforced by an ingenious system of probation based on a postponement of judgment for a fixed term, this new flexibility enabled the Council to act more energetically, and in the 1890's effective action was taken against such common abuses as canvassing for patients, the employment of unqualified assistants, and "covering" by association with unqualified and unregistered persons. Warning announcements were made in the medical journals of the day by the Council, and in 1905 these were given formal shape in the first Warning Notice. Enlarged and consolidated in 1914, this was printed in the *Register* of 1915 in much the same terms as those familiar until June, 1958, when a new Notice was drafted to incorporate other offences which have come more frequently to the notice of the Council in recent years. Until 1951 offenders were brought before the full Council, but the Act of 1950 sanctioned the appointment of a special Disciplinary Committee of 19 members as well as appeal to a court from its decisions.

The Struggle for Direct Representation

Apart from this gradual definition and moulding of the Council's character as a legal body there were important developments in the constitution of the Council which can be traced directly to constant and heavy pressure from the profession at large. On the passing of the Act of 1858 the Medical Reform Committee of the British Medical Association was reconstituted as the Committee on Medical Legislation, with the chief object of securing the election of direct representatives to the Council and the establishment of a "single portal of entry" to the profession, the lack of uniformity in the standards of the numerous licensing bodies offering too many opportunities for the entry of "licensed quacks" who could well be both illiterate and incompetent. There was also widespread discontent with the fact that many who were admitted to the *Register* possessed only "half qualifications" (in medicine *or* surgery only), but were legally entitled to engage in general practice requiring a knowledge of medicine and surgery and midwifery.

The Council gave a great deal of time and thought to this problem, and eventually sought amending legislation to rectify this last error; but, stimulated by the penetrating observations of John Simon at the Privy Council, a request was made that the Council should submit proposals which would remedy all the obvious defects of the Act. After lengthy discussions and complicated negotiations between the licensing bodies a miracle of agreement was achieved, for a plan was accepted which would set up three conjoint boards, one for each division of the United Kingdom, who would examine all candidates and grant a full basic medical qualification.

A new Act was drafted in 1870, but it made no provision for "direct representation" of the profession, chiefly, it seems, because Simon warned the Council that Parliament would never consider a Bill containing such a provision. The Association refused to support a Bill without it, with the result that the one in preparation was abandoned. The Council was so angered by this failure that five of its members, including Acland, Paget, and Stokes, who were all Vice-Presidents, resigned from the Association. Taken aback by this strong reaction, but undeterred by the immediate results of its insistence, the Association continued its campaign for another unrewarded decade, at the end of which a Royal Commission was appointed to investigate the complaints of the profession. The conclusions of its report, issued in 1882, recommended (1) a single portal of entry; (2) a reduction in the numbers of members of the General Council; (3) a large direct representation of the profession in the Council; and (4) that it be the duty of the Public Prosecutor to take action against unqualified practitioners. An ambitious amending Act embodying all these points was sponsored by the Government in the spring of 1882, but, although it was passed by the Lords, it did not reach its second reading in the Commons before the end of the session.

In the following four years other influences were at work and the Act of 1886 actually increased the number of members of the Council to 30, the licensing bodies each being given an individual representative and their number being increased by the inclusion of the Victoria University, which then incorporated the university colleges of Manchester, Liverpool, and Leeds. So much for the "single portal of entry." But the Act was a triumph for the reformers in that five "direct representatives," elected by all registered practitioners, were henceforth to sit on the Council, "as it was highly important that the Profession should have full and complete confidence in the Council."

On the occasion of the Council's jubilee in 1908 Sir William Turner recalled the difficulties of the passing of the Act of 1886 after committees, royal commissions, and governments alike had tried their hands upon its framing, and he paid a gratifying tribute to the influence of the direct representatives who came into being under that Act. On the same occasion Sir Walter Foster (afterwards Lord Ilkeston) recalled that he had been one of the first direct representatives elected, and he claimed that their admission to the Council had exerted a great influence in raising and safeguarding the ethical standards of the profession, a fact recognized in gratifying terms by *The Times* in a leading article on the Council's Jubilee. Under the Act of 1950 the number of what are now officially termed "elected members" was increased to 11 in a Council of 47, including two for Scotland and one each for Ireland and Wales. In 1931, Sir Norman Walker, a direct representative elected by Scottish votes, became President of the Council.

Other Accomplishments

No historical sketch of legislation affecting the constitution and functions of the Council would be complete without mention of the Dentists' Act of 1878, which extended the registration—and consequent disciplinary—functions of the Council to dental practitioners. Working on the precedents already established in its regulation of the medical profession, the Council in effect created the dental profession from a body of tradesmen of whom only 483 (less than 10%) had any kind of qualification. When the Dental Board of the United Kingdom was established in 1921 it was able to take over from the Council the supervision of a profession whose education and ethical standards were rapidly approaching those already attained by their medical colleagues. Since 1956 dentists have had their own General Dental Council.

The Council was never involved directly in the controversy over the admission of women to the profession. If they were legally qualified then they had to be admitted to the *Register*, and, indeed, Elizabeth Blackwell was registered in 1859 by virtue of her medical degree from Geneva University in the State of New York. The Council had no medical women among its members until 1933.

Those engaged in practice in Britain but who had qualified abroad were entitled to registration under the Act of 1858. "Colonial" and foreign practitioners were allowed to apply for registration on a basis of reciprocity by the Act of 1886, and since that year more than 16,000 Commonwealth and foreign practitioners have been registered, there being more than 13,000 on the *Register* to-day. In recent years Commonwealth registrations have sometimes been more numerous than the total of Scottish and Irish registrations Since 1947 temporary registration has been granted to sufficiently qualified practitioners from overseas who have secured hospital appointments in Britain, and the number of these temporary registrations now averages some 500 a year.

The Council's work for medical education and the *Pharmacopoeia* is discussed fully elsewhere in this issue. Much has been accomplished since Rivington justly complained in 1879 that "the least satisfactory part of the work of the Council has been given to professional education." Although the number of licensing bodies now existing and represented on the Council would have horrified those who spent years fighting for a "single portal of entry," we can now see that their relations with the Council and with each other have been transformed in the past 50 years—and in a way which we may regard as typically British. Persuasion, rather than compulsion, has been the chief instrument of reform, and a uniformity of standards has been achieved without sacrificing that variety and flexibility which is so necessary if initiative is not to be stifled. Public criticism and praise—for the Council's proceedings have been in public since 1864—have also been powerful in revealing faults and weaknesses and in illuminating good examples for others to follow. Only once, in 1895, has the Council been forced to take the extreme step of reporting to the Privy Council on the inadequacy of the diploma issued by a licensing body.

The development of a corporate spirit within the Council was not notable during the first half of its existence. Men of forceful character and strong opinions, as many of the early Council members were, often need the moderating

influence of a strong president. Fortunately for the subsequent developments of the Council's activities, such a president was found in Sir Donald MacAlister, whose term of office (1904–31), by far the longest of any President, must be accounted that which has had the greatest influence on the Council's history. Nobody to-day would claim that the Council is our "Medical Parliament." By the press and the public it is chiefly regarded as "our High Court." But that it has become a model of organization for other professions and other countries is sufficient tribute to its success in achieving two aims which the framers of the 1858 Act may have regarded as incompatible—the serving of the public interest and the advancement of the medical profession.

Many other books and articles, apart from those mentioned in the References, have also been consulted, but I am especially indebted for help and advice to Mr. Walter Pyke-Lees, Registrar of the Council, whose own booklet, *The Centenary of the General Medical Council*, is to be published by the Council on November 23, 1958.

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THE INFLUENCE OF THE GENERAL MEDICAL COUNCIL ON EDUCATION

BY

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The General Council of Medical Education and Registration was established by an Act of Parliament in 1858. Its principal purpose was to improve the education of doctors and create some semblance of order from contemporary chaos.

Nineteenth-century Background

At the beginning of the nineteenth century, as Dr. Charles Newman (1957) has pointed out in an admirable book, orthodox medicine in this country had reached a stable state in three orders—the physicians, the surgeons, and the apothecaries—and the chaos was largely but not entirely due to the fact that there was a fourth estate of unorthodox or empirical practitioners. How many totally untrained people practised as doctors before 1858 will never be known; early in the nineteenth century they were certainly numerous, and investigation in one English county reached the alarming conclusion that they outnumbered the qualified by nine to one. This county, however, was probably exceptional, because estimates based on the Census returns of 1841 suggested that only 5,000 of the 15,000 persons then practising in England were unqualified. In 1813 a Bill had been introduced in the House of Commons to put down empirical practice but failed to gain support—presumably because there was then no possible substitute for the numerous quacks.

The position may have improved somewhat with the establishment of private medical schools linked with the hospitals, but the committee appointed in 1834 to inquire into the state of the medical profession revealed a very unsatisfactory state of affairs when it published its evidence in the following year. Not only were the evils of quackery manifest, but also the inadequacy of the training of many of the "qualified." Men, for instance, could take a degree in Arts, walk a hospital from three to six months, and immediately be licensed to practise as physicians. The academic course in medicine at the older universities must at that time have afforded ample opportunity for the use of leisure. Candidates had to be present at two dissections, "keep an act," and attend the lectures of the regius professor during three terms. It was found on inquiry, however, that in one university no regius professor had lectured for a hundred years, but degrees in medicine were nevertheless conferred. In Scotland, where the traditions of Boerhaave and Leyden were preserved, things were very much better.

Surgeons and apothecaries often served long apprenticeships and were probably more usefully equipped than physicians for the work they were to do—particularly when the apprentice was able to supplement his vocational training by a course at a private medical school. The conditions (and cost) of apprenticeships, however, were determined by negotiation between the parties concerned, and often the student might be little more than a menial servant.

Another factor that contributed to the general confusion was the number and diversity of the licensing bodies that had the right to confer professional titles. Before 1858 there were 21 such bodies (if the Archbishop of Canterbury be included), and the titles of most of them were valid in specific areas only (Heseltine, 1949): an Edinburgh licence, for instance, conferred no right to practise in London, and certainly none in Glasgow. As these bodies relied for their financial support on the fees they could extract from students, they at times embarked on dubious commercial competition: students, they found, could be tempted to enlist under the banner of an authority that would offer a cheaper licence and less severe examination.

Early Years

It is against this background that the influence of the General Medical Council must be judged a hundred years later. In its early years in the field of education the powers of the Council were very limited. It could require licensing bodies to supply it with particulars of their courses of study and examination; it could send visitors to examinations; and it could report to the Privy Council that in its judgment the courses and examinations were insufficient and should not confer a right to registration. Strangely enough, the Council had no power to insist on examinations in clinical subjects; neither could it refuse admission to the register to a candidate who had passed only a partial examination—in other words, a man could practise as a qualified and registered doctor if he had satisfied examiners either in medicine or in surgery. Twenty-eight years later this was remedied by the Medical Act of 1886, and the Council was enabled to secure the maintenance at final or qualifying examinations of a standard of proficiency "such as guarantees the possession of the knowledge and skill requisite for the efficient practice of Medicine, Surgery and Midwifery." It is a tribute to the influence of the Council that all licensing bodies had established clinical examinations many years before the Act of 1886 gave the Council power to insist on them (Pyke-Lees, 1958). Not until 1950 did the Council become entitled to inspect medical schools in order to determine whether the instruction given to students was satisfactory.

At its meetings in 1858 the Council decided there was urgent need for the improvement of the general education of students. That is not surprising. England has been dilatory in measures to provide general education for her young.

Prussia insisted on primary education for all children in 1717 at a nominal fee; a national system of free education followed in 1807. Elementary schools were established throughout France soon after the Revolution, and education was fostered by the Founding Fathers of American Independence. England waited until 1880 before she made elementary education compulsory, and secondary education was not recognized as a public responsibility until this century.

In 1858 few of the licensing bodies insisted on any standard of general education as a condition of admission to their examinations, and the Council must have been in considerable difficulty. The expected decline in quackery after the issue of the *Medical Register* called for an immediate increase in the number of qualified doctors, and if the required standard of general education were suddenly raised in a country in which schooling was the privilege of the well-to-do there was a risk that the candidates for training would be fewer. It says something for the courage of the Council that it ventured to press this matter on the licensing bodies so early.

Problem of the Curriculum

Some of the minutes of the Council soon after it came into existence have a strangely modern ring. The most striking of them are quoted in the Introduction to the current Recommendations (1957). In 1863 they noted, with concern, a tendency towards an "overloading of the curriculum . . . followed by results injurious to the student."

In 1869 similar fears were expressed, and the Council adopted a resolution that "some limit must be assigned to the amount of knowledge which can be fitly exacted." To help the licensing bodies and medical schools it endeavoured to define precisely the minimum standards that would be acceptable.

By 1885 the problem of the congested curriculum was still acute, but the fifth President of the Council, Sir Henry Acland, pointed the way to the right solution in truly prophetic words:

> "Whereas the tendency was, and rightly, some years since to issue Recommendations in more and more detail the last revision, by common consent, and after the most careful consideration, has reduced them to a few general Regulations resting on broad educational principles. . . . The several subjects . . . have become so vast in the eyes of most specializing experts that selection and abridgement must be made. It must be made, within limits, by the responsible teachers and the responsible examiners connected with the several Licensing Bodies, subject to the general supervision by this the court of appeal for all."

It is altogether fitting and proper that Sir Henry Acland's words should be reprinted, for they reflect the general opinion of the Council 70 years later. His liberal policy was in agreement with that of the Medical Acts Commission of 1881:

> "It would be a mistake to introduce absolute uniformity into medical education. One great merit of the present system, so far as teaching is concerned, lies in the elasticity which is produced by the variety and the number of educating Bodies. Being anxious not in any way to diminish the interest which the teaching Bodies now take in medical education, or to lessen their responsibility in that respect, we desire to leave to them as much initiative as possible. In certain matters of general importance, such as the duration of study and the age at which a student should be permitted to practise, common regulations, ought, we think, to be laid down; but we wish to record our opinion that nothing should be done to weaken the individuality of the Universities and Corporations, or to check emulation between the teaching institutions of the country."

Despite the authority of these statements there is no doubt that the medical curriculum became increasingly congested and fragmentary as the years passed, and in 1944 the Goodenough Committee called on the General Medical Council to undertake its drastic overhaul as an urgent necessity. The Committee recorded its opinion that "in deciding the importance that should be attached to the various subjects and the type of instruction that should be given the bias should be towards the needs of the future general practitioner," and in the same paragraph called for instruction in a number of subjects which "did not receive the attention they should at the present time." The final result of the Goodenough proposals was a curriculum even more congested than it had ever been, for the Council expanded its Recommendations in 1947 to include some of the additional subjects that the Committee asserted were necessary to the training of a general practitioner.

Right of Registration

The truth is that ever since its birth in 1858 the General Medical Council has faced a wellnigh insoluble problem. The appropriate Medical Acts require that the right of registration in the *Medical Register* shall not be conceded to any persons unless the Council is satisfied that such persons have followed courses of study and passed examinations which ensure the possession of the requisite knowledge and skill for efficient practice. Until a few years ago it was possible for anyone to proceed to independent practice immediately after registration, and as the Council came into existence for the protection of the public it was almost inevitable that its published Recommendations concerning the curriculum should place considerable emphasis on vocational training and include a large number of subjects for which a plausible case could be made in argument that some knowledge of them was essential to independent clinical work. But the rapid and continuous advance of knowledge in clinical subjects and the basic sciences on which they rest has made anything more than a superficial acquaintance with all of them quite impossible for the average student at the time of the qualifying examination.

The attempt to include everything conceivably necessary for efficient practice made many courses of instruction at medical schools grim exercises in memorizing factual data in preparation for examinations, and often led to neglect of the critical study of principles and independent thought. Although the General Medical Council is invariably blamed for this unfortunate result, the fault does not lie exclusively or indeed mainly with it. Repeatedly it has said in the introduction to its Recommendations that it wishes a liberal view to be taken of them and it was prepared to welcome experiment in education and diversity of method. Frequently it has pointed out that its duty was the maintenance of a minimum standard for registration and not the definition of an ideal system of education for a medical school. By ignoring these exhortations, however, and by implying that suggestions in the Recommendations had the force of law, heads of departments in medical schools could, if they were so disposed, insist like Shylock on their pound of flesh—that is, on a certain quota of the student's time, which, in some curious way, was considered to be an index of departmental prestige and significance. And there is little doubt that departmental pressure of this kind led to the situation in 1944 which induced the Goodenough Committee to demand a drastic revision of the curriculum.

It has been suggested that a courageous and enlightened Council might have taken the initiative earlier and requested a revision of the Acts by which it was bound in order to introduce reforms in education. That it might, for instance, have recommended a single portal of entry to the *Register* by means of a State examination under its control and permitted the schools to shape their curricula as they wished. This policy, at the instigation of Sir John Simon, was discussed by the Council and approved, but it did not receive the sanction of Parliament in 1886. Opposition would have been intense from licensing bodies like the Royal Colleges, who were concerned particularly with examinations, and the decision of Parliament was wise and fortunate.

Attitude towards Reforms

It has been urged, too, in some quarters that the Council might well surrender its right of inspection of examinations and visitation of schools and be guided by the verdict of the University Grants Committee, which inspects schools thoroughly every five years. But the authority of the University Grants Committee does not extend beyond university courses and examinations, and it would probably not wish for any addition to its labour. Eire, in any event, is not within its jurisdiction.

It is extremely unlikely, therefore, that agreement could have been reached on any reform, because there is no doubt that controversy about the right type of training still persists and in some quarters is bitter. There are those who believe that the medical student should be mainly taught the techniques of a practical art, while others hold that his training should be shaped by the academic ideal of a sound training in basic and clinical science in the hope that he will emerge with a critical mind which enables him to take advantage of the experience that will come to him in practice. Reasonable people agree that both types of training are necessary, though opinions differ over the emphasis to be accorded to each of them. The General Medical Council was wise not to enter any of the fields of conflict. It realized that many of the provincial medical schools had been absorbed by civic universities and that these young and vigorous institutions, jealous of their autonomy and independence, were unlikely to accept readily precise directions on the curricula of their faculties and that the idea of reasonable diversity in educational matters would be sooner achieved if it left the responsibility of experiment to the individual schools and was content to maintain an adequate minimum standard which was the duty imposed on it by Act of Parliament.

The liberal character of the current Recommendations which set the schools almost entirely free to plan their own curricula is not due to an abdication of responsibility on the part of the Council; the change is a sensible recognition of a new situation. The medical schools are now mature, and in Great Britain and Northern Ireland they are free from the poverty that crippled them less than twenty years ago.

The compulsory pre-registration year of hospital practice under supervision, the establishment of the consultant service, and the fact that a period of assistantship almost invariably precedes independent general practice make it extremely unlikely that the public will suffer at the hands of an insufficiently trained doctor. In such circumstances the Council felt able to give more freedom to the schools.

The great achievements of the General Medical Council in education belong to the first fifty years of its existence; its influence was paramount in raising medical practice from the status of a dubious trade to that of a learned profession. The following fifty years were a period of consolidation rather than activity. The Council was content to wait on the development of the schools and finally to place on them the responsibility for experiment and further advance. That policy, in view of all the difficulties, the future will probably justify.

Work Overseas

The educational work of the Council is not restricted to these islands: in the immediate past it has done as much for medical education in the Colonies as its predecessors accomplished in England in the early years. No one who has visited medical schools in the Colonies or in countries like India, which have since become independent, can have failed to notice the immense prestige of the Council overseas. To obtain recognition of their training and degrees as qualifying for admission to the English *Register* has been and still is the ambition of many of them.

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THE HISTORY AND DEVELOPMENT OF THE "BRITISH PHARMACOPOEIA"

BY

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Descriptive catalogues of drugs claimed to be useful in the practice of medicine have been compiled since the night of time, and a bibliography of them published in Germany in 1784 includes such classic names as Celsus, Pliny, Galen, Dioscorides, Avicenna, and Paracelsus. The first work of this nature, however, with the imprint of authority was probably the *Dispensatorium Pharmacorum Omnium* issued in 1546 with the sanction of the Senate of Nuremberg. The title "pharmacopoeia" is said to have been applied for the first time to a book published in Basle in 1561.

In England the importance of ensuring the purity of drugs was officially recognized as long ago as 1518. In that year the Letters Patent constituting the College of Physicians granted by Henry VIII provided for the election of four persons appointed by the College to have the supervision and scrutiny of every kind of medicine and the prescription thereof by physicians practising within a radius of seven miles of the City of London. A subsequent Act of 1540 gave such persons power to enter the premises of all apothecaries and to destroy any defective drugs found there. The first *London Pharmacopoeia*, dedicated to James I, was published by the College in 1618, a century after its foundation. It included no fewer than 1,028 drugs and 932 compounds, often of a bizarre and even revolting character. Subsequent editions appeared regularly, the tenth and last *London Pharmacopoeia* being published in 1851. From the beginning the book had authoritative countenance and proceedings were authorized against those compounding medicines in any other form than therein directed.

In Scotland the President and Censors of the College of Physicians of Edinburgh, which received its Charter from Charles II in 1681, were likewise empowered to inspect drugs and medicaments offered for sale within the city and suburbs and to throw into the street or destroy those found to be insufficient or corrupt. Similar activities were undertaken in Glasgow by the Faculty of Physicians and Surgeons. The Edinburgh College published its first *Pharmacopoeia*, dedicated to William III, in 1699, and subsequent editions were issued at intervals till 1841, when the fourteenth and last *Edinburgh Pharmacopoeia* appeared.

The Censors of the College of Physicians in Ireland, founded by Charles II in 1667 and reincorporated by William and Mary in 1692, were similarly ordered to inspect medicines within the City of Dublin and its environs and to destroy those which were defective. It was not, however, till 1807 that the first *Dublin Pharmacopoeia* appeared, and a revised edition was published in 1826. The third and last *Dublin Pharmacopoeia* was issued in 1850.

The First British Pharmacopoeia

The inconvenience resulting from the existence of three different pharmacopoeias in the United Kingdom and Ireland was considerable, and when the Medical Act of 1858 established the General Council of Medical Education and Registration it enjoined the Council among other things to publish a single pharmacopoeia to supersede those of London, Edinburgh, and Dublin. Immediately after its constitution, therefore, a committee of the Council was set up to take the necessary steps for the preparation of a *British Pharmacopoeia*. This committee consisted of members of the Council, and was divided into three subcommittees, meeting respectively in London, Edinburgh, and Dublin. The task of reducing to one standard the processes and descriptions of three pharmacopoeias and of reconciling the varying pharmaceutical customs and prescribing idiosyncrasies of the three countries must have been formidable, and, perhaps not surprisingly, the work which was published in 1864 was found to have many imperfections. Thus more than half of the 28,000 copies published were destroyed and a loss of £1,206 was incurred on the first edition. The Council issued a second and more successful pharmacopoeia in 1867, a third in 1885, a fourth in 1898 (with an Indian edition in 1901), and a fifth in 1914.

The preparation of each volume was undertaken by a committee of members of the Council. It could only be by a fortunate coincidence that there might be on the Council from time to time men who possessed the specialized knowledge requisite for the compilation of such a work, for members of the Council are selected not with a view to their fitness and capacity to prepare a pharmacopoeia, but rather because of their general ability, their administrative gifts, and their professional standing. Thus it was necessary for the committee in preparing each new pharmacopoeia, especially the later editions, to make extensive use of outside technical assistance by invoking the aid of pharmacists and other experts. Early in the present century it became clear that these external authorities were dissatisfied with the status accorded to them in relation to the work. They argued that if their co-operation was indispensable, as it was conceded to be, their position should be recognized by giving them a right of participation in the work not merely as consultants but as colleagues.

The difficulty was resolved by a report prepared in 1928 by a subcommittee of the Committee on Civil Research under the chairmanship of the Right Hon. H. P. Macmillan—afterwards Lord Macmillan. As the result of its recommendations a British Pharmacopoeia Commission was established with a permanent secretary and other officers employed by the Council. The Commission consists of up to a dozen medical and non-medical experts appointed from time to time by the Council, acting in accordance with recommendations made by a selection committee, four members of which are nominated by the Council, two by the Medical Research Council, and one each by the Pharmaceutical Society of Great Britain, the Pharmaceutical Society of Ireland, and the Pharmaceutical Society of Northern Ireland. The Commission, which maintains a laboratory, is financially self-supporting through the sales of the *Pharmacopoeia*.

Thus the Council accepts responsibility for the work of the Commission which it calls into being. On questions of policy the Council retains the power not only to give general directions to the Commission but to refer back to it for reconsideration any matters it may deem proper. This does not involve any lessening of the Commission's responsibility on the technical side, while the position of the Council resembles that of many other eminent bodies which rely upon the work of expert committees and are prepared to accept responsibility for it. Under these arrangements the Council published the 1932 *Pharmacopoeia*.

Intervals Between Editions

It was originally intended to publish the seventh edition not later than 1942, but wartime conditions caused its postponement till 1948. The progress of pharmaceutical and therapeutic knowledge then became so rapid that the Council, on the advice of its Commission, resolved that in future the normal interval between the publication of editions should be reduced to five years, with an Addendum some two and a half years after the issue of each volume. There had, of course, been many Addenda to previous editions of the *Pharmacopoeia*.

The preparation, publication, printing, and selling of successive editions of the *Pharmacopoeia* were provided for by the Medical Act of 1858 and the Medical Council Act of 1862. These statutory provisions were amended by the Medical Act of 1950, which, among many other things, contained a section that made two notable innovations in regard to the *British Pharmacopoeia*. The Medical Act of 1858 defined the *Pharmacopoeia* as a book "containing a list of medicines and compounds, and the manner of preparing them, together with the true weights and measures by which they are to be prepared and mixed, and containing such other matter and things related thereto as the Council shall think fit." This definition was appropriate to the preponderance of galenical preparations contained in the earlier editions; these were controlled largely by their formulae and methods of preparation rather than by a series of tests and assays.

The Act of 1950 describes the *Pharmacopoeia* as containing "such descriptions of and standards for, and such notes and other matter relating to, medicines, preparations, materials and articles used in the practice of medicine, surgery or midwifery as the Council may direct." Thus the permitted scope of the *Pharmacopoeia* was at once enlarged both in the range of materials which may be the subject of monographs and in the variety of information which may be included. The replacement of "medicines and compounds" by "medicines, preparations, materials and articles" makes it clear that diagnostic agents, surgical dressings, ligatures, haemostatics, and the like are all within the authorized scope of the *Pharmacopoeia*. The elaboration of analytical procedures for controlling the purity of drugs has caused the appendices of the *Pharmacopoeia* to be greatly extended so as to provide details of chemical, physical, and biological tests.

The second innovation provided by the Medical Act facilitates the introduction of a new edition. Formerly, the General Medical Council had no authority to publish a new edition in advance of the date on which it came into effect, and the best arrangements which could be made for interested parties to consult advance copies of a new *Pharmacopoeia* still caused great inconvenience, especially to those working at a distance from the Council's office. The Council is now authorized to publish the book in advance of the date on which it is to have effect. Thus the *British Pharmacopoeias* of 1953 and 1958 did not become official until a period of six months had elapsed from the date of their publication.

Authoritative Standard

The observance of the *London Pharmacopoeia* in the making and compounding of medicines was enjoined by the Order-in-Council of 1851, but there has been no legislation dealing generally with the legal status of the *British Pharmacopoeia*. There are references to it in a number of enactments which confer statutory recognition for certain purposes, as in the Pharmacy and Medicines Act and the Pharmacy and Poisons Act. It is accepted as providing standards for certain drugs by the Drug Tariff issued in accordance with the National Health Service regulations. The substantial legal protection provided for the public to ensure the purity of drugs is found in the provisions of the Food and Drugs Act, 1955, as in the earlier Act of 1938. The policy there expressed does not refer by name to any particular standards, but in general terms requires that "if a person sells to the prejudice of the purchaser any food or drug which is not of the nature, or not of the substance, or not of the quality, of the food or drug demanded by the purchaser, he shall . . . be guilty of an offence."

In this situation a bench of magistrates must accept some authority, and over the years the *British Pharmacopoeia* has been recognized as providing the presumptive standard when a purchaser demands a drug described therein. Decisions made by the High Court from time to time justify the acceptance of certain principles in relation to pharmacopoeial drugs. The sale on demand of such a drug which does not comply with the requirements laid down in the *British Pharmacopoeia* provides at least prima facie evidence that the sample is not of the nature, substance, and quality demanded. It is not necessary for the purchaser to refer specifically to the *Pharmacopoeia*; the use of the official title or subsidiary title is sufficient to establish that the article demanded was that specified in the book.

Drugs Included in the "B.P."

The selection of drugs to be included in the *Pharmacopoeia* is decided principally on clinical and pharmacological grounds, but pharmaceutical knowledge is a factor in deciding on the form in which drugs are to be presented for use. In selecting the drugs for inclusion the endeavour is made to produce a book that will represent the latest achievements of medical science while at the same time recognizing many older forms of medication of proved value which are still in frequent use and still require control. Thus in the 1958 *Pharmacopoeia* monographs on new drugs such as hyaluronidase, hydrocortisone, radioactive isotopes, noradrenaline, reserpine, and the tetracyclines rub shoulders with 150 respected survivors from the first *British Pharmacopoeia* of 1864, such as atropine, digitalis leaf, ferrous sulphate, opium, magnesium carbonate, and senna.

Before determining the articles to be included in the book a large number of medical and pharmaceutical authorities are consulted. The proposals are submitted for comment to medical and pharmaceutical bodies and individual experts throughout the British Commonwealth as well as to the special committees appointed in the Dominions to deal with pharmacopoeial revision, and decisions are taken by the Commission after consideration of the recommendations received. The wide range of information contained in the book makes it necessary for the Commission to appoint many committees of experts, each of which is presided over by a member of the Commission, to elaborate the specifications required for the monographs and appendices.

In addition the Therapeutic Substances Act authority is consulted on all matters which come under the control of its regulations. There is a constant exchange of information with the Committee of Revision of the *United States Pharmacopoeia*, and the Commission is kept informed of the work of the expert committees of the World Health Organization and the *International Pharmacopoeia*. Consultation with the Revision Committee of the *British Pharmaceutical Codex* is maintained with the object of keeping the two works in harmony.

Nomenclature

The 1953 edition of the *Pharmacopoeia* will be remembered for the introduction of English instead of Latin titles. It would, for example, have taxed the ingenuity of the most erudite scholar of the humanities to have rendered into tolerable Latin "Concentrated Human Red Blood Corpuscles," and the practice of changing the last syllables in such English titles as acetomenaphthone and sulphadimidine to acetomenaphthon*um* and sulphadimidin*a* had become an act of supererogation.

A further activity arising from pharmacopoeial nomenclature was the recognition by the Council, on the recommendation of the Commission, of "approved names" for certain drugs. This activity became necessary early in the last war through the disappearance of certain German drugs known only by their trade-mark names and the consequent need for official non-proprietary names for their British counterparts. Thus mepacrine was provided as the approved name for the drug previously known as "atebrin." After the war the great developments of the pharmaceutical industry led to the introduction of vast numbers of new drugs issued under various proprietary names. The unsatisfactory position created by the issue of the same drug under a variety of such names by different manufacturers and the restrictions put upon their use is generally acknowledged and has been the subject of frequent comment. The intention is to provide non-proprietary names which can be used by any manufacturer, prescriber, or pharmacist, and, if the drug is eventually described in the *British Pharmacopoeia*, the approved name is used as the official title. A list of these approved names, showing also the proprietary names, some of them trade-marks, is published by the Council from time to time. A pamphlet containing these lists is included in each copy of the *Pharmacopoeia*, and numbers of them are sent to hospitals and medical schools.

The Metric System

The gradual displacement of the Imperial System of Weights and Measures by the metric system has proceeded throughout the history of the *Pharmacopoeia*. The first edition referred only to the Imperial system. In the second edition of 1867, solutions for volumetric analysis were defined in terms of British Weights and Measures and Metrical Weights and Measures. In 1898 the metric system entirely replaced the Imperial in all analytical procedures, and the formulae for preparations were expressed in both systems. In the 1914 edition the statements on doses were given in both systems and the formulae in the metric system only. In the 1953 edition the metric system alone was used throughout the appendices and monographs except in the expression of doses of substances commonly prescribed in the Imperial system. For these latter the Imperial dose was stated in parenthesis after the metric dose. All the doses of the new drugs introduced into the 1958 edition are given in the metric system only, for these drugs have almost invariably been introduced into medicine and used in dosage terms based on the metric notation, and nothing would be gained by adding an equivalent Imperial dose. The Council has approved the recommendation of its Commission that in the 1963 *Pharmacopoeia* all reference to the Imperial system should be entirely abolished.

A Misconception

Some of the criticism of the *British Pharmacopoeia* proceeds from a misconception of the purpose of the work. It is not designed to be a manual of therapeutics to be consulted by the doctor in his daily practice. For him its function is that of a guarantee that when he prescribes a drug mentioned in the *B.P.* he can rely on his patient obtaining an article of the quality and character therein defined. To the dispenser, on the other hand, it is actually a manual of practice. He must dispense according to the standard of the *B.P.* any medicament contained in it which is mentioned in the prescription handed to him.

The long intervals which in the past sometimes separated the publication of one edition from another—particularly the time which, owing to the war, elapsed between the editions of 1932 and 1948—sometimes resulted in the *British Pharmacopoeia* being derided as an old-fashioned compendium of drugs which had had their day and been found wanting. Now that the *Pharmacopoeia* is produced every five years with an Addendum two and a half years after each publication this criticism no longer applies. The 1958 *Pharmacopoeia* is a very modern scientific work, and might indeed be criticized more for running too far ahead of medical practice than for lagging excessively behind it.

The Next Edition

Like the labours of Sisyphus, the production of successive editions proceeds without interruption, and when the Commission of 1953–8 demitted office on September 1—the date on which the 1958 *British Pharmacopoeia* became official—a newly appointed Commission immediately took up the task of preparing the 1963 edition.

ELIZABETH BLACKWELL AND THE "MEDICAL REGISTER" FROM 1858*

BY

ANNIS GILLIE, M.B., M.R.C.P.

It was 100 years ago, in 1858, that Elizabeth Blackwell returned to this, her own country, as a qualified medical practitioner from the United States of America, and thereby fitted herself for inclusion in the first *Medical Register*, published in 1859, as a doctor of foreign qualification but practising in this country. It is true that no woman trained and qualified in Great Britain was to be registered for another eight years, but the influence in this country of that indomitable yet so gentle woman dates from the year 1858.

Her Family

Elizabeth Blackwell was the third of eight surviving children of Samuel and Hannah Blackwell, and was born in 1821 in Bristol. Her father was established there as a sugar refiner, though he was born and reared in Worcester, and a contemporary of our founder, Sir Charles Hastings. Hannah Blackwell, Elizabeth's mother, the daughter of a prosperous Bristol merchant, was an admirably stable wife and parent to her crusading husband and her adventurous children. As a middle-class mother she paid full attention to the social training and standing of her daughters throughout her long life. Her immediate reaction to the crises in her daughters' lives was to dispatch a new bonnet, and she was always concerned lest Elizabeth should neglect the advantages of fashion in her professional life.

Samuel Blackwell was a passionate reformer, a friend of the downtrodden and of the refugee, and a nonconformist. As an active slavery abolitionist he complicated his position in the sugar trade in this country, and ruined it in the United States of America. He believed in equality of education for sons and daughters, and reared his family with the best opportunities for both until he died. His belief in physical activity and independence for boys and girls alike was ahead of his time. He was a man of great moral and physical courage. During the notorious riots in 1830, which were particularly destructive in Bristol, he, with two friends, dissuaded the mob from burning down St. Mary Redcliffe. Probably as a result of his sympathies with the rioters, his own factory was one of the few that escaped destruction in that year, only to be burned down accidentally two years later. This financial disaster led Samuel Blackwell to emigrate, taking his entire family, hoping to establish his new vacuum process of sugar-refining in the New World. After an Atlantic crossing of seven and a half weeks they reached New York in the throes of a cholera epidemic.

Elizabeth retained vivid memories of England as it was when she left it at 11 years old, including her sight of William IV's coronation procession. She first saw New York as a country town of Dutch brick and frame houses that were largely destroyed in the disastrous fire a few years later, which she witnessed. Washington Square was an open common, and Manhattan Island a quiet countrified town. New York was a city of violent extremes. Brawling and rioting at all hours existed alongside extreme Quakerism in belief and behaviour. Advanced fashions were seen in the same streets with peasant poverty and backwardness. Enlightened reformers lived alongside industrialists so reactionary as to be capable of violence as well as ostracism when their opinions were opposed.

A few years only served to show that Blackwell could not hope to prosper. He was not only opposed to slavery, but he concealed abolitionists and even escaped slaves from danger. He died in 1838, after moving on towards the west, leaving eight children, penniless and in debt. Elizabeth at 17, the child he valued most, was the dominant character among the older ones. The three elder sisters paid the debts and reared the young family by teaching, much of the time in a school established by themselves.

By 1844 Elizabeth felt that her young brothers and sisters were able to fend for themselves. She had meanwhile come to make friends with a cultivated and advanced-thinking group of people, including Dr. Warrington, of Philadelphia, the Beechers, and the Stowes: Harriet Beecher Stowe, author of *Uncle Tom's Cabin* was a lifelong friend. Harriet Martineau was a friend of her father's and of her own, and knew the Blackwells in both countries.

Urge towards Medicine

Many factors contributed to Elizabeth's decision, taken at this time, to train as a doctor of medicine. There was her upbringing and memories of her father's crusading life, her own need for some fully constructive outlet. It is recorded that a dying friend begged her to aim at the profession of medicine itself. She was, too, indignant that the title of "female physician" was a well-used euphemism for abortionist, and in particular for a notoriously dangerous and prosperous woman in that line of work in New York. There was also the necessity of supporting herself, and she did not wish to continue to follow the profession of school-teaching. Lastly, and perhaps most important,

Medical School at Geneva, N.Y., which graduated the first woman doctor in the United States—Elizabeth Blackwell.

*Presidential Address to the Metropolitan Counties Branch of the British Medical Association, 1958.

she seemed to feel an urge to do the most difficult things, whether great or small. Her brother Henry maintained that it was the apparent impossibility of entering the medical profession that set her to do it. During the years of struggle to achieve her training she herself wrote, "If the path of duty leads me to Hell I shall go there." And again, "The moral fight possessed an immense attraction for me."

From the age of 23 until 26 she continued to teach; for, having tried and failed to borrow the money for her training, she worked to save it. After 29 colleges had refused her application, Geneva College, in New York State, agreed to accept her. The faculty of the small college was opposed to her entry, but the dean, Dr. Lee, pointed out the disadvantage of rejecting the request of her eminent sponsor, a distinguished physician of Philadelphia, and the possible advantages of the advertisement of her presence. He suggested referring the matter to the students, but stipulated that their decision must be unanimous. The students, perhaps with the hope of entertainment and notoriety, as well as the zeal of the young in a young country, voted in her favour, with one dissenter, who was set upon until he withdrew his No. Their chairman drew up a formal resolution, treasured by Elizabeth all her life, beginning, "That one of the radical principles of a Republican Government is the universal education of both sexes . . ."; and concluding, "In extending our unanimous invitation we pledge ourselves that no conduct of ours shall cause her to regret her attendance at this institution." They seem to have kept their word fairly successfully.

Graduation

She started work in November, 1847, five weeks late in the session, and graduated as best student in January, 1849. This startlingly short medical education was actually a few weeks longer than many American colleges provided at that date. For the graduation ceremony she dipped into her dwindled savings to buy a black brocaded gown with narrow lace at the neck and cuffs, and a black fringed cape. Her brother, who was present, recorded her refusal of the senior physician's invitation to walk in the academic procession "because it would not be ladylike."

Elizabeth Blackwell at the age of 28, when she graduated from Geneva College in 1849.

It is interesting to try to visualize this woman. She was slight and short, 5 foot 1 inch tall, with small hands and feet, fair hair, with a general effect described by her mother as "wispy," offset by the intensity of her large grey eyes, her broad brow, and the personal dignity recognized by all who saw her. It was a family joke that on occasion she could look 14 feet tall. She disliked references, as in the *Boston Medical and Surgical Journal*, to a "pretty little specimen of the feminine gender." She dressed more plainly than pleased her mother, but with feminine care. A little later Professor Rouyer wrote of her in *Clinique Européenne*, "She is the personification not of American Bloomerism, but of therapeutics in crinoline." From 1851 on she wore a loose-fitting tailored jacket over her dress when at work, called by her her "doctoreal sack." Her manner was obviously well bred and skilled, even when most determined. She danced well and enjoyed it, but could immure herself in a chosen programme for months or years at a time.

After graduation Elizabeth was well received, almost fêted, in New York and Philadelphia, but opportunities in that country for the experience she needed so badly after the brief training of the period were hard to come by. She had spent her summer vacation in the women's syphilitic department of Blockley Almhouse, and had no illusions about what lay ahead of her. She soon decided to come to Europe to work in Paris, where she understood that students of all types were welcomed. On the way she made a brief visit to Birmingham, and was shown over the General Hospital, then to London for parties, St. Thomas's Hospital, and a "pharmaceutical soirée." In Paris she called first upon Lamartine at the Elysée, then met Claude Bernard. There she was faced with disappointment, for her only opening to practical midwifery was to work as midwife in the hospital La Maternité. She worked there indefatigably, under very rough conditions, recognizing the opportunity for practical experience, until in November, 1849, she contracted gonococcal ophthalmia. This interrupted her work for nearly a year, and at one time even seemed likely to put an end to all her plans for the future. In June, 1850, however, she faced the need for excision of the affected eye, and therewith gave up all thought of the surgical career that she had intended to pursue.

Welcome in London

In August, 1850, she arrived in London to study, and began to make those friends who were to be of such importance in the year 1858. The governing body of St. Bartholomew's Hospital agreed to her working there for twelve months. Dr. James Paget gave her a special welcome, and supported her throughout her stay—and the students cheered her. She was given access to all departments except that of female diseases, a prohibition which provoked a sentence in a letter to her sister Emily, "A hundred years hence women will not be what they are now."

During the following months she made friends with Dr. Benjamin Brodie, who as Sir Benjamin was to be the first president of the General Medical Council; with Florence Nightingale, with whom she discussed preventive medicine, which was to be Elizabeth's principal work during the latter half of her life; with the advocates of the newly conceived Ling's gymnastic system. She renewed contact with Harriet Martineau. A sister reported, "She is visiting in learned and aristocratic circles everywhere." Friends who were to be important in the future were Bessie Rayner Parkes (later Madame Belloc, mother of the two authors) and Bessie Leigh Smith, who were already making women aware of their helpless position in the English social structure. Her capacity for loyal and lasting friendship with outstanding men and women had a great influence on events in the future, events which have affected the lives of so many of us.

Work in the U.S.A.

Elizabeth Blackwell returned to New York in 1851 and remained there until her next visit to England in 1858. In 1852 she founded a small dispensary, and left it a flourishing infirmary, opened in 1857 on the birthday of her friend Florence Nightingale. This was an essential step for her, since her attempts to work in existing hospitals were rejected. She was greatly distressed by "a blank wall of social and professional antagonism which faces the woman physician, that forms a situation of singular and painful loneliness."

Her sister Emily (after working under Sir James Simpson in Edinburgh) and Dr. Marie Zakrewska joined her at the infirmary. Patients mounted to more than 3,000 individuals in the year 1857, together with considerable private practice. In addition, she started to lecture and to write on

hygiene, physical activity, and sex instruction for women and girls; this, a complete innovation for the period, provoked such enthusiasm as well as criticism that she observed, "I think my writings belong to the year 1998." Dr. Jacobs, an eminent American paediatrician, commented in 1900, "It has taken fifty years for us to bring even the head of the line up to her standard."

A Significant Event

In 1858, therefore, it was an experienced woman who arrived in London at the age of 37, just in time to qualify by residence and practice (though holding a foreign degree), for entry of her name on the first *Medical Register*.

Elizabeth Blackwell's name on the first *Medical Register* is seen to be something larger than the penetration of a woman into that one profession, or even the entry of women into professions generally. It was significant, not only for women, but as part of the far larger struggle of all those debarred by virtue of creed, as well as class and sex, from the franchise, from the Services, and from university education in England. Until the foundation of University College, London, in 1827, only those men who subscribed to the articles of the Established Church could graduate from a university in England, a disability removed in the senior universities in the latter half of the nineteenth century, in the teeth of opposition. This struggle for opportunity, in which so many men and women were involved, is the background of the wide support given to Elizabeth and to her immediate successors.

Elizabeth Blackwell seems never to have recorded her reasons for the long visit to England in 1858-9. She must have foreseen its value to herself and to posterity in enabling her to register under the wide conditions permitted to foreign graduates in that first year.

By 1858 the two young women, Bessie Rayner Parkes and Bessie Leigh Smith, Elizabeth's friends of seven years before, had organized the Langham Place Group to provide information, opportunities for discussion, and, wherever possible, work for women of gentle birth who needed it. They invited Elizabeth Blackwell to lecture on "Medicine, a profession for ladies." She had a large and influential audience, including William Cowper-Temple and Russell Gurney, who were to take such an active part in the House of Commons in the matter of medical registration of women in 1875. Here, too, she met a girl of 21, "that bright, intelligent young lady . . . Miss Elizabeth Garrett," whose interest she aroused and whom she almost directed into the profession of medicine.

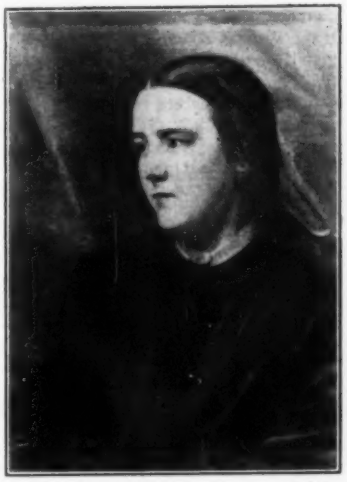
Her sense of perspective in evaluating the trends of the present and the future were also apparent when she again came to England in 1869, this time to reside here until her death in 1910. 1869 was three years after Elizabeth Garrett's name had been placed on the *Medical Register*, and it marked the beginning of the years of opposition to any further entries. Between 1851 and 1858 Elizabeth Blackwell had founded the dispensary in New York and seen it transformed into an infirmary. Between 1859 and 1869 she had opened a medical school in that city with the astonishingly long curriculum of three years, and had seen her pupils establish schools in Boston and Philadelphia. Ten other medical schools had received women students. In addition, she had spent herself physically and spiritually in organizing a service of trained nurses for the American Civil War, the civil war based on the slavery issue, which ran back to her earliest memories. Her infirmary had cared for black and white patients alike, and had survived the fierce opposition this provoked. She was 48, and weary. She felt that others could carry on the work started in the United States by herself. "It is my nature to start anew; and what is done is done, I will leave it," were her own words at that time. She was well aware of the need for her mature personality and her experience back in England during the next decade, "to assist in the pioneer work so bravely commencing in London."

Conditions in Great Britain

The second Elizabeth had emulated the first, but in an older country, where both tradition and prejudice were more firmly established. Enough time, too, had elapsed since the first Elizabeth's graduation for its full significance to be apparent. For Elizabeth Garrett, and for her immediate successors, the difficulties were how and where to obtain medical teaching recognized by examining bodies, and then to persuade examining bodies approved by the General Medical Council to examine them. The story of Elizabeth Garrett's piecemeal training in London and in Scotland, and her acceptance as candidate by the Society of Apothecaries because she could not be refused as a "person," are well known, as is the change in the Society's charter after examining her, so that the inlet was closed to future aspirants.

Less well known is the result of her application to enter London University based on its original liberal charter that it was available "to all classes and to all denominations." Professor Grote, the Vice-Chancellor, led the party in her favour in the senate. The voting was 10-9 for it, but reversed to 10-11 against by the Chancellor, Lord Granville, using his vote and his casting vote. The opponents maintained that a woman could be neither a "class" nor a "denomination."

Equaliy well known is the unhappy story of those women who attempted to graduate in medicine at Edinburgh University between 1870 and 1873. The opposition led by Professor Christison has often been recounted. The enormous amount of support given to these women by the *Scotsman*, by the Lord Provost of Edinburgh, by several members of the medical faculty, and by many other members of the University, as was shown by the close voting in the senatus at the time of the lawsuit and appeal, is often forgotten. Then, too, it is overlooked that in spite of the struggle seven women did obtain full medical training in a recognized medical school, and, though denied graduation in the north, they were able to graduate elsewhere in due course without additional delay.



Sophia Jex-Blake at the age of 25; founder of the London School of Medicine for Women. (Painted by Samuel Lawrence.)

A Courageous Group

In August, 1874, the need for a recognized school of medicine admitting women students led Sophia Jex-Blake, with three well-known medical men, to call a meeting of those interested with a view to founding such a place of training.

As the result of this meeting the London School of Medicine was opened two months later, with 17 students. The original expenditure had been met by 14 friends contributing £100 each. A distinguished teaching staff was easily secured, including Dr. Burdon Sanderson and Mr. Anderson Critchett, but recognition was refused by all 19 examining bodies. All hospitals in the neighbourhood, including the Royal Free Hospital, refused admission to the students for clinical teaching, so that non-recognition was scarcely surprising. The foundation was a magnificent, almost an absurd, gesture of faith in the future.

Sophia Jex-Blake had been working in America, when she met Dr. Lucy Sewall, a pupil of Elizabeth Blackwell's, who diverted her interest from education to medicine. Of the three medical men who had formed her first committee, two, Dr. T. R. Chambers and Mr. A. T. Norton, were on the staff of St. Mary's Hospital, Praed Street, where Richard Martineau was active at the foundation of the hospital some few years before, and remained a member of the board. Richard Martineau, great admirer and confidant of Harriet, his cousin, herself an old friend through two generations of the Blackwell family in two countries, must have been well aware of Elizabeth Blackwell's qualities.

The third supporter, Dr. F. E. Anstie, of the Westminster Hospital, was an outstanding personality. He had already spent himself in trying unsuccessfully to persuade his own hospital to admit women students. He was said to be a sound clinician and a vigorous teacher, but above all an enthusiast for preventive medicine. He died tragically at the age of 40 from fulminating septicaemia contracted at a post-mortem examination, only a month before the opening of the new school of which he was to have been dean. "His humanity was enthusiastic, passionate, and urgent. . . he threw himself warmly into the political and social movements of his profession, and always on the side of the weakest, always in support of liberty and progress." These words are from his obituary notice in the *British Medical Journal*, and indicate some of the impetus in launching the school. Elizabeth Blackwell, after brief hesitation, was a member of the board from the outset, and must have given heart to this courageous group as well as contributing her practical experience and her reputation.

The Issue of Registration

In 1875 matters began to move rapidly as the result of untiring work by some of the women and their supporters. William Cowper-Temple (later Lord Mount Temple) promoted a bill "To remove doubts as to the powers of Universities of Scotland to admit women as students and to grant degrees to women"; this was withdrawn, ostensibly to enable the universities concerned to discuss the matter. A little later he promoted another to enable medical women with foreign degrees to be registered in this country, as in the first year, 1858. This matter obviously came within the purview of the General Medical Council, and was referred to them by the Duke of Richmond, Lord President of the Privy Council, together with the whole issue of the future registration of women doctors.

The discussion that took place in the Council was reported in the *British Medical Journal* with astonishing fullness. Six pages report the proceedings of committee, and no fewer than sixteen the discussion in Council, which occupied the greater part of three days. All present were agreed that registration of foreign degrees could not be allowed, either for men or women, since there could be no control of training abroad by the Council. It was on the larger issue of registration of women medical practitioners that the speakers were divided so strongly. The main supporters were led by Professor George Rolleston, F.R.S., and he spoke on the widest aspects of the subject: "It is either a great thing or a small thing. If it be a great thing, you should not oppose it, if it have a root of goodness in it . . . if it be a small thing, why make all the fuss about it? . . . Let them try, because many of them will succeed." And Sir William Gull, the Queen's Physician in Ordinary, said: "I consider there are some parts of the medical profession that a highly trained woman could do better than a man." The final compromise resolution was skilfully worded, after a gloomy preamble concerning the women's prospects, "... the Council are not prepared to say that women ought to be excluded from the profession." The *Dublin Medical Press* commented, "A clear stage and no favour."

Meanwhile, early in 1876 Sophia Jex-Blake had found, as she thought, an open door, though a back door, to registration. The Royal College of Surgeons had a rarely used Diploma of Midwifery, which, with a few wider questions in the *viva voce* examination, was a registrable qualification. Counsel's opinion taken by the Royal College confirmed that it had no power to refuse the women's applications. Certificates of study were submitted and accepted, and candidates were informed of their acceptance for examination. Immediately following this, the Chairman of the examining board and both the other examiners resigned, and no others had been appointed a year later.

This lowest point of indignity and absurdity proved to be critical. Sir James Paget, that long-standing friend of Elizabeth Blackwell's, was President of the Royal College of Surgeons at this time. He obtained an interview with the Duke of Richmond in May, and stated that he "desired to vindicate the College from any wish to break faith with the women whom they had promised to admit. . ." to examination. Almost at the same time a deputation from the new London School of Medicine, led by Lord Aberdare, ex-Lord President of the Privy Council, also waited on the Duke of Richmond.

In June, Cowper-Temple withdrew his Foreign Degrees Bill and Russell Gurney, Recorder of London, promoted an Enabling Bill, giving all 19 examining bodies the power to examine women candidates. The Act received the Royal Assent in August.

Testing the Act

Without further delay the women put the Act to the test. It seemed fruitless to make a further attempt in Scotland. London had taken no steps to secure a new charter implementing its recent agreement in principle to the admission of women to all faculties. It was to Ireland that the women turned, sending over in September two of their number trained in Edinburgh. Sophia Jex-Blake recorded that "two of our ablest and most popular fellow students, Miss Pechey and Miss Shove, started for Dublin to see what help we could get from Irish chivalry," and added that Edith Pechey had "poise and a natural ease of address which made her difficult to resist."

The Queen's University, with its streak of the austere north perhaps, interposed a veto owing to the opposition of one man. The Irish College of Physicians, however, did not resist Miss Pechey. It rose to the occasion and agreed to admit women to examination and diplomas. A further important step was obtained by the recognition by the Irish College of the London School of Medicine as a teaching body. That step was only possible since the treasurer of the school, James Stansfeld, who had held office under Gladstone, was just concluding personal negotiations with the governors of the Royal Free Hospital for clinical teaching facilities, reversing the earlier decision to exclude women students.

Next it fell to Edith Shove, now a registered medical practitioner, to apply to London University, in December, 1876. In February, 1877, it was moved in the Senate that her request be granted. The voting was 14—7 in her favour, and this time the Lord Chancellor, still Lord Granville, supported her. Those who voted in her favour included the two staunch friends of the women, Sir James Paget and Sir William Gull, the Master of the Rolls, and Dr. Archibald Billings, F.R.S., known as the Father of the Medical Profession, since he had qualified in 1811 and was still actively at work.

It is interesting to remember that when nine women's names were on the *Register* they formed themselves in 1879 into a professional society. The name is significant—"The Association of *Registered* Medical Women." It was registration above all that mattered to them. Dr. Elizabeth Blackwell was the first chairman, and all nine women were members. It was a body of vital importance to this small group and their immediate successors, for no other central professional association was available for them to join at that time. This Association survived until 1917, when it merged with other units to form the Medical Women's Federation.

It was in 1875 that Sir Robert Christison, the same who had led the opposition in Edinburgh, was president of the British Medical Association. Both women on the *Medical Register* were members, and both had been admitted through the Metropolitan Counties Branch, a step stoutly defended by the Honorary Secretary of the Branch in a letter to the *British Medical Journal*. Elizabeth Garrett Anderson was invited to give a paper in the section on obstetrics, and this Sir Robert firmly opposed. Elizabeth Garrett Anderson stood her ground, saying that she would withdraw only if her paper was considered unworthy to be delivered. It is well to know that not only was she allowed to give her paper but when, later in the year, the referendum vote proved to be 3—1 against the admission of women to membership, the final decision was not made retrospective. Elizabeth Blackwell seems to have resigned, but Elizabeth Garrett Anderson remained an isolated figure in the Association for almost 20 years.

In 1894, with speeches of superb gallantry, the B.M.A. welcomed "female members" once more, after the resolution rescinding the veto of 1875 had been passed with almost no opposition. The loyalty and the professional unity resulting need no reference.

Conclusion

I have tried to show that the presence of this isolated middle-aged woman, Elizabeth Blackwell, in this country in the years from 1858 to 1879 had a considerable influence on events. Her family tradition and training, her wealth of professional administrative experience, were always behind the younger women. She had great personal courage, stability, and far-sightedness. She was essentially a product of the first half of the nineteenth century in the scale of her ideals and achievements and the width of her contacts. She personally selected Elizabeth Garrett Anderson, and one of her first pupils advised Sophia Jex-Blake to become a doctor. Her friends, and friends of friends on both sides of the Atlantic, were untiring and active supporters of the movement to secure medical training and registration for women. Above all, her qualities of mind, her personality, and the innovations of her work in New York and this country must have been effective in steering this group of women and those who helped them through these years.

Elizabeth Blackwell at the age of 84.

"It is my nature to start anew; and what is done is done, I will leave it"—strange words, and a big legacy.

Professor JOHN BRUCE, president of the Royal College of Surgeons of Edinburgh, on November 14 opened an extension to Duncan, Flockhart & Co.'s research laboratories in Edinburgh, consisting of additional development and biological laboratories. The former are in the chemical laboratory building, which also houses the analytical control department and the library. The new biological laboratories form part of a quadrangle of buildings where biological research and assay are carried out.

THE DISCIPLINARY COMMITTEE AND THE COURTS

BY

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The Disciplinary Committee of the G.M.C. sitting in the Council Chamber looks rather like a court of law; so much so that people are apt to suppose that it must be exactly like a court of law and that its rules and procedures will therefore be practically identical with those which a court would apply. There is, of course, a good deal of substance in the analogy. In general the Committee does model its proceedings on the pattern set by the courts, and when difficulties arise the Legal Assessor naturally advises the Committee in the light of his own experience as a practising lawyer. None the less, there are quite a number of instances in which the analogy breaks down, and the result is sometimes surprising to those who are inclined to regard the Committee as just another sort of court.

In the first place, most people, when they think of a court of law in this connexion, have not made up their minds whether they are thinking of a civil court trying actions or of a criminal court trying prisoners. Looking at the end-result, which may be a sentence of erasure, one is put in mind at once of a criminal court sentencing a convicted man. But even here the analogy is not apt; for the Committee, unlike the judge, has only one sentence that it can pronounce. It is true that it can postpone its sentence for a year or two in order to see how the practitioner behaves in the meanwhile, but in the end decision can only be: to erase or not to erase. Moreover, the Committee is always studious to remind itself that its function is not to punish the delinquent practitioner but simply to determine wih high-minded objectivity whether the public interest requires that he be erased from the *Register*. In a case, therefore, where the practitioner has already been convicted and sentenced by a court of law—for example, for indecent assault—and is now before the Committee as a consequence of that conviction, it is injudicious for his advocate to plead that he has already been punished enough without the added penalty of erasure. What he ought to say is that the sentence which the practitioner has already served (or is serving) has brought home to his mind the enormity of his misconduct and is thus itself a guarantee that he will never offend again. (It is merely a question of putting the point tactfully.)

But the nature of the charge made against the practitioner often suggests a different line of thought. A canvassing case, for instance, is seldom in the least like a criminal prosecution. As often as not, it is a quarrel between two practitioners who were recently in partnership, and closely resembles civil litigation.

Some Difficulties

It is more fruitful to examine the differences than the analogies between the Committee and the courts. Let us look first at the Committee's members. They come from all over Great Britain and both parts of Ireland. Most of them are either in general practice as doctors or hold teaching, clinical, or administrative appointments. They assemble at 44, Hallam Street twice a year and are always, and understandably, anxious to finish their business by the end

of the week. There are great difficulties, therefore, about adjournments. It is quite common in courts of law to stand a case over for a few days to meet the convenience of a witness or because one of the parties is not well. But a case before the Committee cannot normally be stood over for less than six months, and is therefore less likely to be stood over at all. (It is possible to convene a special meeting of the Committee out of season, but it is hugely inconvenient.)

Then again, it must be remembered that there is only one Committee. The Dental Board of the United Kingdom once tried a case of alleged indecent conduct by a dentist towards one of his patients. During the luncheon adjournment the Legal Assessor, who had only recently been appointed, discovered that he was the only person present at the hearing who did not know that a similar complaint against the same dentist by another patient had come before the Board two years previously. (One is happy to add that in both cases the practitioner was acquitted.) In a criminal case, if counsel for the defendant is aware that the jury, or some of them, know about the previous record of his client he will challenge them and have them replaced by jurymen who do not. But there was only one Dental Board; its members were irreplaceable; they had a duty to try the case; and there was therefore nothing that could be done about it. The composition of the Disciplinary Committee of the G.M.C. varies from time to time, but it is obvious that a similar (if not precisely similar) situation could arise. At any rate, the opportunities of challenge are severely restricted.

Jurisdiction

More striking than the matter of personnel is the matter of jurisdiction. The jurisdiction of the Disciplinary Committee is world-wide so far as charges of infamous conduct are concerned. A practitioner can be erased on the ground that he has been convicted in a court of law only if the court was sitting in the United Kingdom or Ireland; but he can be erased for infamous conduct wherever his infamy was perpetrated.

An instructive example is the case of Ong Bak Hin (reported on appeal to the Privy Council in [1956] 1 W.L.R. 515). Dr. Ong, who qualified in Edinburgh in 1915, was convicted in the High Court of Malacca in 1953 of having unlawfully performed an operation of abortion. Since the conviction had been recorded abroad it could not be treated as a conviction for the purposes of the Disciplinary Committee; but, supposing Dr. Ong to have been rightly convicted, he had clearly been guilty of infamous conduct in Malacca. This, therefore, was the charge made against him, and, in effect, the Committee tried over again the issue which had already been determined by the criminal court. But it had to do so without seeing the witnesses, and had to devise its own means for getting on without them. In these respects it was quite different from any British law court. A criminal court sitting in England would simply have declined jurisdiction to try an offence of this sort committed in Malacca. A civil court sitting in England and investigating events which happened in Malacca would have sent a commission out to Malacca to take the evidence of the local witnesses; but the Disciplinary Committee has no power to do this.

Again, no criminal court in England will ever try a defendant in his absence. Either he will have been previously arrested and held in custody until his trial, or he will have been released on bail and will have to surrender on the opening of the Assize or Quarter Sessions. But the Disciplinary Committee has no power to order the arrest of a practitioner or to require bail. It can therefore order (and has in fact ordered) the erasure of a practitioner who does not choose to appear in answer to the charge.

A case like Ong's raises in an acute form the question, What evidence may the Committee receive in support of the charge? Although the Committee may subpoena witnesses, a subpoena will not run outside the United Kingdom—for example in Eire, the Channel Islands, or anywhere further afield—and, lacking the powers of a court to take evidence abroad, the Committee must in many cases manage as best it can on something less than the sort of evidence which would be acceptable in the courts. In Ong's case the judge's notes, taken at the trial in Malacca, of the evidence given by the Malayan witnesses were used as evidence before the Committee, and this procedure was approved on appeal by the Privy Council.

Many other cases can be imagined, and have indeed presented themselves, where the rules of evidence which prevail in courts of law cannot be applied strictly to proceedings before the Committee. Accordingly, a rule has been adopted, after discussion not only with the Medical Defence Societies but with the Privy Council Office and the Lord Chancellor's Department, which provides, in effect, that where possible the rules of evidence prevailing in criminal courts shall be applied, but that, where this is not possible, "the Committee may receive as evidence any such oral, documentary or other matter as, after consultation with the Legal Assessor, they may think fit." The Legal Assessor naturally inclines to the view that he can be trusted to advise the Committee properly, but he is also sobered by the reflection that, if he does not, the Judicial Committee of the Privy Council can be trusted to say so.

It should be noted that an appeal against erasure is the only appeal provided by the Medical Act. A practitioner whose name has been erased may apply to the Committee in due course (and most of them do) for its restoration to the *Register*, but there is no appeal against their refusal to restore it. (It is best to avoid erasure in the first place.)

Inability to Award Costs

Another point which distinguishes the Committee from courts of all kinds is that it has no power to award costs. This may seem hard on the practitioner who has successfully defended himself against a charge of infamous conduct in a professional respect. But often the injustice is more apparent than real. There is always a prima facie case of some sort against the accused practitioner (otherwise he would not have been summoned to appear before the Disciplinary Committee), and the facts which are proved are generally more or less discreditable. It by no means follows from the fact that the Committee is not prepared to describe the practitioner's conduct as "infamous" that any of them regard it as unobjectionable. Those of us who have extensive experience of the criminal courts are inclined to be sceptical of the view that he whom the jury finds to be not guilty ought never to have been tried. It often does him all the good in the world to be tried.

Moreover, the Committee's inability to award costs sometimes acts as a protection against ill-founded complaints. Many patients and other people seem to be of the opinion that if the family doctor behaves in a way that they disapprove of they have only to write a letter to the G.M.C. to get him hauled over the coals. Such people are often deterred on being told by the Registrar that no complaint made by a private person can even be considered until it has been supported by a statutory declaration. Some are not deterred by this requirement, but, having filed one or more statutory declarations, are inclined to suppose that the complaint will then go forward without further trouble to themselves. When they are told that they will be expected to present the case and produce their witnesses to the Disciplinary Committee at their own expense they sometimes decide to proceed no further.

The Penal Cases Committee

This is one of the most delicate and important aspects of the work of the Penal Cases Committee, which has the preliminary duty of determining whether a complaint should be referred to the Disciplinary Committee or not. The Penal Cases Committee has the power, and has exercised it, to

direct that the case shall be presented to the Disciplinary Committee by the Council's solicitor and at the expense of the Council. If the complaint is of a serious nature and the supporting evidence seems likely to be strong it is plainly in the public interest that it should be investigated, even though the complainant has not the means to pay for his part in the inquiry. It may also be thought fair, if a patient conceives himself to have a serious grievance against his doctor, to allow him to ventilate it, even though the evidence on which he relies appears to be somewhat feeble; but in such a case it may not be unfair to tell him that he will have to bear his own costs of the inquiry. The Penal Cases Committee is almost unknown to the profession, but it acts as a most valuable filter, and the President has been heard to describe its work as more important than that of the Disciplinary Committee.

As already mentioned, a complaint of infamous conduct will not be considered by the Penal Cases Committee unless (to quote the language of the rule) "there has been furnished to the satisfaction of the President one or more statutory declarations in support thereof." By another rule the accused practitioner, if the complaint goes forward to the Disciplinary Committee, is entitled to have copies "of any statutory declaration sent to the Council." But it must be borne in mind that if, on the strength of "one or more" statutory declarations, the Penal Cases Committee sends the case forward, the complainant will be entitled at the hearing to call as many other witnesses as he chooses. In comparison with the procedure of the courts this puts the accused practitioner in a position midway between that of a defendant to a civil action and that of a defendant to a criminal prosecution. The former has no right to see the statements of any of the witnesses proposed to be called by the plaintiff; the latter has a right to see the statements of all the witnesses proposed to be called by the prosecution. The accused practitioner may see the statements of those who have made statutory declarations but not of others.

Conviction of Criminal Offences

The last point of difference to be noted between the courts and the Disciplinary Committee is that there are two matters on which the Committee may not hear evidence at all. The fact that a practitioner has been convicted of a criminal offence by a court of the United Kingdom or Ireland is of itself sufficient to give the Committee jurisdiction to erase his name from the *Register*. Whether it will do so or not will depend on the gravity of the crime, the circumstances which led up to it, the previous character of the practitioner, and similar matters. What it may not consider is the correctness of the conviction itself. The practitioner, unlike a litigant in the courts, cannot be heard to say that he was wrongly convicted. This rule and its practical results are not nearly so widely understood as they should be.

Let us suppose (for such things have happened) that a young practitioner has been to an evening celebration in London—a celebration perhaps of his own admission to full registration. After the dinner he strolls back to his hotel through Hyde Park. Suddenly a torch flashes, a policeman's hand descends upon his shoulder, and other figures, including a second policeman and another arrestee, emerge from the background. Our practitioner is marched off to a neighbouring police station, where he is told that he and the other man (who has already admitted his guilt) will be brought up before the magistrate next morning on a charge of committing acts of indecency with each other. He is also told that if he pleads guilty he will probably be fined 10s. and no more will be heard about it. He takes this advice; and the next that he hears about it is a summons to attend before the Disciplinary Committee. He there discovers to his horror that, having been convicted upon his own confession, he cannot now be heard to say that he never did anything wrong at all. It is a tenable view that the words "Never plead guilty" should be printed on the back of every registrable diploma.

Finding of Adultery

The other finding which a practitioner is not entitled to dispute is a finding of adultery made against him by the Divorce Court. This dates from the Medical Act, 1950, which transferred the disciplinary functions of the G.M.C. to the present Disciplinary Committee, and, in deference to the distaste felt by members of the Council for re-trying divorce cases, provided by S.18 (now S.33(2) of the Act of 1956) that "any finding of fact which is shown to have been made in any matrimonial proceedings in the United Kingdom or the Republic of Ireland, being proceedings in the High Court or the Court of Session or on appeal from a decision in such proceedings, shall be conclusive evidence of the fact found." To a practising lawyer this section is astonishing, since there is probably no proceeding in the High Court in which important issues of fact are decided on such flimsy evidence as in an undefended divorce case. At any rate, it is worth recalling as a medico-legal curiosity the immediate impact of this section.

Although the Act of 1950 received the Royal Assent on July 28 of that year, "the appointed day" did not dawn until April, 1951. At its session in November, 1950, the Council as a whole was therefore still in command of disciplinary cases and was not bound by S.18. A practitioner was charged with adultery with one of his patients. Her husband had taken divorce proceedings and cited him as the co-respondent. Since the wife and the practitioner were as anxious as the husband that the divorce should go through, they did not defend these proceedings. However, the learned Divorce Commissioner was unimpressed with the evidence of adultery offered by the husband, which was that of two inquiry agents who had kept a nocturnal watch on a lighted bedroom window at long range through a pair of binoculars, shared between them. To the consternation of all parties the Commissioner dismissed the petition. The husband appealed, and the Court of Appeal, after studying the transcript of the evidence and hearing argument, concluded that the Commissioner was wrong in refusing to infer adultery, inferred it themselves, and granted a decree. This inference was gladly accepted by the practitioner and the wife so far as the divorce proceedings were concerned; but it was a very different matter when the case came before the G.M.C. There was now no question of letting it go undefended. For the first time the case was fully tried out, in the sense that the wife and the practitioner both gave evidence and the inquiry agents were cross-examined. In the result, the Council had no doubt whatever that the Commissioner had been right and that adultery had not taken place. If S.18 of the Act had been in force the practitioner's name would probably have had to be erased.

In May, 1951, the newly formed Disciplinary Committee met for the first time. The first complaint brought before it was a charge of adultery. The accused practitioner had been in partnership with another doctor. The latter, alleging that his partner had committed adultery with a patient of the practice, served notice under the partnership deed of immediate dissolution. The allegation was denied, and the outcome was a witness action in the Chancery Division, where the whole matter was thrashed out over several days of examination and cross-examination before Mr. Justice Vaisey, who found the adultery proved. Before the Disciplinary Committee, however, the practitioner persisted in denying it; and, though S.18 of the Act of 1950 was now in force, it turned out not to be applicable, since the finding of the court had not been made "in any matrimonial proceedings." The Committee had therefore to reinvestigate the whole case *de novo*. It is satisfactory to be able to add that it arrived at the same conclusion as Mr. Justice Vaisey.

The duty of the Committee is to hold an "inquiry"—not a trial; and, though the one is very like the other, it is not exactly the same thing.

ENDOCRINE CONTROL OF BLOOD SUGAR, LIPAEMIA, AND KETONAEMIA IN DIABETIC BABOONS

BY

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Complete removal of the pancreas from normal baboons, as in other mammals, leads to the development of the classical features of diabetes, including hyperglycaemia, ketonaemia and ketonuria, polydipsia, and polyuria. Investigation of the diabetic state in experimental baboons revealed that the severity of the ketosis could not be correlated with the degree of hyperlipaemia or with the hyperglycaemia, and that the extent of the hyperglycaemia did not influence the hyperlipaemia (Gillman *et al.*, 1958a). On the basis of experiments conducted in dogs, cats, and rats, it is generally believed that the fundamental disorder of carbohydrate metabolism in diabetic animals is alleviated by hypophysectomy, or by adrenalectomy, and that the administration of pituitary extracts and of adrenocortical hormones will once again restore the diabetic picture in depancreatized-hypophysectomized and in depancreatized-adrenalectomized animals respectively (Houssay and Biasotti, 1931; and Long and Lukens, 1936).

Reinvestigation of the role of the hypophysis and of the adrenal in depancreatized baboons not receiving insulin will show that the severity of the diabetes, as assessed by the hyperglycaemia and glycosuria, is not immediately alleviated by hypophysectomy although the clinical condition of the baboon is improved. It will also become apparent from the data presented below, taken in conjunction with previously reported experiments (Gillman *et al.*, 1958a), that each aspect of the disorder of lipid metabolism is dependent upon a particular pattern of endocrine function. It is suggested that analysis of the various lipid fractions in the blood as well as of the blood sugar and blood ketones in each human diabetic may afford a useful guide to the relative participation of the endocrine glands in maintaining the disorder of metabolism.

Material and Methods

Five male baboons were totally pancreatectomized, the entire gland being carefully dissected away from its intimate attachment to the duodenum. Between 2 and 14 months after pancreatectomy the baboons were totally hypophysectomized, a transorbital approach devised by one of us (E. E.) being employed for this procedure (Gillman and Gilbert, 1956). As the pituitary gland was removed under direct vision we were satisfied that no fragments remained. Moreover, when the baboons eventually came to necropsy, macroscopic as well as microscopical examination of the contents of the sella turcica revealed no sign of residual pituitary gland.

Three of the five depancreatized-hypophysectomized (D.-H.) baboons were subjected to various forms of endocrine therapy. Cortisone was administered on a body-weight basis—namely, 1 mg./kg. body weight—while thyroxine was given intramuscularly in amounts of 0.2 mg. three times a week. Acetone-dried anterior lobe of human pituitary gland, obtained from necropsy cases, was pulverized and administered to the baboons as a suspension in normal saline by subcutaneous injection. At the time of each administration of crude pituitary the baboons also received 150,000 units of "seclomycin" as a prophylactic measure.

The daily insulin requirements of the D.-H. baboon ranged from 6 to 10 units in baboons weighing from 11 to 18 kg. The baboons received food *ad libitum* and maintained a steady body weight.

In all instances, blood samples for the estimation of the various lipid fractions, ketone bodies, and glucose were obtained at 9 o'clock in the morning, 16 hours after the last dose of insulin and the last meal. The total lipids were estimated by the nephelometric method of Kunkel *et al.* (1948), the total cholesterol according to the procedure described by van Zyl and Kerrich (1955), the lipid phosphorus by the method of Whitehorn (1924), with van Zyl's modification, and the ketone bodies according to the method of Werk *et al.* (1955).

Reactions in Depancreatized Baboons

After removal of the pancreas the suspension of insulin treatment for four days led in 15 baboons to a hyperglycaemia exceeding 400 mg./100 ml. and glycosuria, a threefold to sevenfold increase in total lipids (903–2,184 mg./100 ml.), a twofold to fivefold increase in total cholesterol (175–780 mg./100 ml.), a one-and-a-half to threefold increase in lipid phosphorus (12–34.6 mg./100 ml.), and a 4 to 47-fold increase in ketone bodies in the plasma (Gillman *et al.*, 1958a). Institution of insulin treatment restored the blood sugar, the blood lipids, and the ketone bodies to within normal ranges (Gillman *et al.*, 1958a, 1958b). Thus removal of the pancreas from baboons produces biochemical changes in the blood similar to those described in human diabetes.

Effect of Hypophysectomy in Depancreatized Baboons

Total hypophysectomy was carried out in five depancreatized baboons. Soon after operation it was noted that the glycosuria of the D.-H. baboons was not abolished and could be controlled only by the administration of insulin. However, the sensitivity of the D.H. baboons to insulin was greatly increased and the daily requirements were reduced to one-third or even one-fifth of the prehypophysectomy dose.

Two to four weeks after removal of the hypophysis the depancreatized baboons were subjected to a four-day period of insulin deprivation. With one exception the resting blood sugar rose within four days to levels exceeding those observed in the same baboons deprived of insulin prior to hypophysectomy (B. 384, Table I). In one D.-H. baboon deprived of insulin for 10 days the resting blood sugar of 750 mg./100 ml. increased to 1,332 mg. after a feed, a phenomenon which is attributable in part to the reduced efficiency of the kidney.

The most striking feature of the serum lipids in the D.-H. insulin-deprived baboons was the failure of the total lipids to reach levels comparable to those observed during insulin deprivation prior to hypophysectomy, even when insulin was withdrawn for as long as 10 days. The total cholesterol and lipid phosphorus showed a significant rise, and, with

the exception of B. 375 and B. 386, the values were comparable to those observed during insulin deprivation prior to hypophysectomy. Without exception the blood ketone bodies remained low, the maximum reading not exceeding 3.6 mg./100 ml. in B. 386 as compared with a prehypophysectomy level of 70 mg./100 ml. in the same baboon (Table I).

As in the case of the depancreatized baboons, the administration of insulin to D.-H. baboons following a period of insulin withdrawal was attended by a decrease in all the lipid fractions. Thus, removal of the hypophysis from depancreatized baboons did not alleviate the disorder of carbohydrate metabolism, but it prevented the severe ketosis and the severe lipaemia, affecting mainly the triglycerides.

Effect of Cortisone, Thyroxine, and Crude Anterior Pituitary in D.-H. Baboons

Unfortunately, B. 366 and B. 375 died before our experiments were completed. We are therefore only able to report on the effects of cortisone, thyroxine, and/or crude anterior pituitary on B. 384, B. 368, and B.386.

B. 384 (Table II, Experiments 1 to 3)

After hypophysectomy B. 384 was subjected to one experimental procedure involving the use of crude anterior pituitary. During a four-day period of insulin deprivation the baboon received a total of 0.29 g. of crude anterior pituitary administered in equally divided doses over the four days. The most noteworthy features were: (1) the severe ketosis, the level of the blood ketone bodies being twice as great as in the insulin-deprived baboon before hypophysectomy; and (2) the very high level of the resting blood sugar (1,100 mg./100 ml., experiment 3). The total lipids, cholesterol, and lipid phosphorus rose to levels higher than those observed in the same baboon deprived of insulin and not receiving crude pituitary (cf. experiments 2 and 3), although the lipaemia was not as severe as that observed in the same baboon when deprived of insulin before hypophysectomy (cf. experiments 1 and 3). The baboon became gravely ill, showing extreme polydipsia and abdominal distension. Despite the administration of four times the amount of insulin that was adequate in ordinary circumstances to prevent the baboon from passing into hypoglycaemic coma, the ketosis and the hyperglycaemia persisted for 24 hours after the last injection of crude pituitary. Death could not be prevented.

The administration of crude anterior pituitary to the D.-H. baboon deprived of insulin thus failed to restore the lipaemia to the prehypophysectomy level, but resulted in a ketosis and hyperglycaemia even more severe than that observed before hypophysectomy.

B. 368 (Table II, Experiments 4 to 9)

The daily administration of cortisone for a period of three weeks to the D.-H. baboon, B. 368, doubled the daily amount of insulin required to control the diabetes but did not affect significantly the level of the blood lipids. Withdrawal of insulin for four days was followed by severe hyperglycaemia and glycosuria and a lipaemia even more severe than that observed in the same baboon during insulin deprivation prior to hypophysectomy (cf. experiments 6 and 4). The ketone bodies in the blood remained low (2.8 mg./100 ml.) despite the intense lipaemia (cf. experiments 6 and 5). The institution of insulin therapy promptly reduced all the lipid fractions.

Pretreatment with cortisone and insulin for eight weeks was followed by a two-weeks course of thyroxine in conjunction with cortisone and insulin. Thereafter, withdrawal of insulin for four days precipitated an intense hyperglycaemia, glycosuria, and lipaemia, the greatest increase occurring in the cholesterol and total lipids, which reached levels higher than those in the depancreatized baboon deprived of insulin and having an intact pituitary (cf. experiments 7 and 4). Attention is drawn to the slight elevation of the ketone bodies (9.8 mg./100 ml.), which nevertheless remained low compared with the depancreatized baboon (75.2 mg./100 ml.). After the administration of insulin, the blood lipids returned to normal. Thereafter, the daily amounts of cortisone and thyroxine were gradually reduced and eventually completely withdrawn.

Apart from insulin, B. 368 received no hormonal treatment for six weeks. Insulin was then withdrawn for four days. During this period the baboon received a daily injection of 0.144 g. of crude anterior pituitary. On the third day the

TABLE I.—*Lipids, Ketone Bodies, and Glucose in the Blood of Male Baboons Before and After Pancreatectomy and Hypophysectomy*

Baboon No.	Before Pancreatectomy					After Pancreatectomy*					After Pancreatectomy-hypophysectomy*				
	Total Lipids	Total Cholesterol	Lipid Phosphorus	Ketone Bodies	R.B.S.	Total Lipids	Total Cholesterol	Lipid Phosphorus	Ketone Bodies	R.B.S.	Total Lipids	Total Cholesterol	Lipid Phosphorus	Ketone Bodies	R.B.S.
	mg./100 ml.					mg./100 ml.					mg./100 ml.				
366	420	144	10·0	—	73	1,370	225	12·2	—	410	567	185	13·5	2·7	640
368	384	122	8·5	—	83	1,274	234	17·4	75·2	424	565	236	12·0	2·2	562
375	441	129	11·3	—	93	1,369	294	25·0	12·0	550	548	186	10·5	2·0	666
386	401	126	9·0	—	70	2,113	540	15·8	70·4	430	537	203	12·5	3·6	540
384	332	124	8·5	1·8	87	948	175	12·0	15·4	601	395	152	9·0	3·0	392

* Estimations performed after a four-day period of insulin withdrawal.

TABLE II.—*Lipids, Ketone Bodies, and Glucose in Blood of Pancreatectomized-hypophysectomized Baboons Receiving Cortisone, Thyroxine, and Crude Anterior Pituitary at End of Four-day Period of Insulin Withdrawal*

Expt. No.	Baboon No.	Operation	Treatment	Total Lipids	Total Cholesterol	Lipid Phosphorus	Ketone Bodies	R.B.S.
				mg./100 ml.				
1	384	Pancreatectomy		948	175	12·0	15·4	601
2		Pan.+hypophysectomy	Nil	395	152	9·0	3·0	392
3		,,	Crude pituitary	594	216	14·0	33·0	1,100
4	368	Pancreatectomy		1,274	234	17·4	75·2	424
5		Pan.+hypophysectomy	Nil	565	236	12·0	2·2	562
6		,,	Cortisone	1,588	340	20·1	2·8	601
7		,,	Cortisone+thyroxine	2,003	544	27·6	9·8	666
8		,,	Crude pituitary	610	144	8·1	68·0	1,332
9		,,	Cortisone+thyroxine+crude pituitary	2,115	406	20·1	86·0	380
10	386	Pancreatectomy		2,113	540	15·8	70·4	430
11		Pan.+hypophysectomy	Nil	537	203	12·5	3·6	340
12		,,	Thyroxine	437	126	5·9	1·6	510
13		,,	Cortisone+crude pituitary	3,910	630	25·4	88·0	395

baboon became listless and anorexic. The outstanding feature of the blood chemistry in B. 368, as in B. 384, was the severe ketonaemia which approximated to that observed in the depancreatized insulin-deprived baboon (cf. experiments 8 and 4) and the profound hyperglycaemia, the blood sugar rising to 1,332 mg./100 ml. The total lipids were slightly elevated but much lower than in the D.-H. baboon receiving cortisone or cortisone and thyroxine but no insulin (cf. experiment 8, with experiments 7 and 6). By contrast, the cholesterol and the lipid phosphorus values were much reduced compared with those of the D.-H. baboon not receiving insulin (cf. experiments 8 and 5).

At the end of the four-day insulin-withdrawal period, B. 368, like B. 384, was found to be resistant to insulin and withstood the injection intravenously of 12 units of unmodified insulin and of 18 units of isophane insulin subcutaneously without developing signs of hypoglycaemia. Within 24 hours the blood sugar of B. 368 was reduced to 540 mg./100 ml. The low physical state of the baboon as well as the continuing poor appetite prompted us to begin cortisone treatment, at first intravenously (10 mg./day for six days) and thereafter subcutaneously (10 mg./day). Although the "toxic" effects of crude pituitary gland were to some extent counteracted by cortisone, as apparently occurs in dogs (de Bodo and Altszuler, 1955), a second baboon (B. 386) failed to respond to cortisone under similar experimental conditions.

After seven weeks of cortisone and insulin therapy, B. 368 received a three-weeks course of thyroxine in conjunction with cortisone and insulin. During this regimen the total lipids, cholesterol, and lipid phosphorus remained within the range recorded for the D.-H. baboon receiving insulin only. Insulin was then withdrawn for four days, and simultaneously a total of 0.508 g. of crude pituitary was given subcutaneously in equally divided doses over the first three days of insulin withdrawal. Again the baboon became severely ill. From experiment 9 it is evident that the biochemical findings in the blood, with the exception of the blood sugar, represent an exaggeration of the results obtained in the same baboon prior to hypophysectomy (cf. experiments 9 and 4). It is evident that in the D.-H. baboon, B. 368, the complete picture of diabetes, including severe hyperglycaemia, hyperlipaemia, and ketosis, could be reproduced by the administration of cortisone as well as crude pituitary, but by neither alone.

Recovery was facilitated by the administration of cortisone and thyroxine continued for a period of five weeks. Thereafter, both cortisone and thyroxine were withdrawn. During the succeeding five weeks, although small amounts of insulin were given daily, morning hyperglycaemia and glycosuria persisted. However, owing to the increasing sensitivity of the baboon to insulin even during the day, the administration of insulin was discontinued for four weeks. During this period the resting blood sugar, which had fluctuated hitherto from 250 to 400 mg./100 ml., suddenly decreased to hypoglycaemic levels (13 mg./100 ml.), thereby precipitating coma in the D.-H. baboon. Following an intragastric feed the blood sugar rose again to hyperglycaemic levels (400 mg./100 ml.), and was maintained at a high level as long as the animal consumed a minimum amount of food daily. It should be mentioned that after the episode of hypoglycaemic coma the baboon refused all food and had to be force-fed by intragastric intubation.

It is thus apparent that in the absence of insulin a depancreatized baboon may develop acute hypoglycaemia after removal of the hypophysis, especially following the suspension of a prolonged course of treatment with cortisone, which may have depressed still further an already underactive adrenal gland. Furthermore, this experiment indicates that (1) in the circumstances mentioned the D.-H. baboon failed to maintain a hyperglycaemia during short periods of starvation, and (2) the underlying defect in carbohydrate metabolism produced by removal of the pancreas was not alleviated by hypophysectomy.

B. 386 (Table II, Experiments 10 to 13)

Having shown that it was possible to reproduce the full diabetic picture in a D.-H. baboon by means of thyroxine, cortisone, and crude anterior pituitary, it became necessary to assess the role of the thyroid in this mechanism. The results of the experiments conducted in B. 386 are shown in Table II.

Prior to hypophysectomy B. 386 received a three-weeks course of thyroxine in conjunction with insulin. The total lipids, cholesterol, and lipid phosphorus remained unaltered. Withdrawal of insulin was attended by a marked rise in all the serum lipids, particularly in the lipid phosphorus, which increased by twofold in comparison with the insulin-deprived baboon not receiving thyroxine.

After hypophysectomy B. 386 again received a three-weeks course of thyroxine with insulin, followed by insulin deprivation for four days. During the withdrawal period the total lipids, the cholesterol, and the lipid phosphorus failed to rise (experiment 12). Thyroxine thus prevented the increase in the serum lipids which had been consistently observed, to a greater or less extent, in the other experiments in which insulin was withdrawn, either before or after hypophysectomy (see experiments 10 and 11).

At the conclusion of the above experiment thyroxine was discontinued and insulin administered in conjunction with cortisone daily for 21 weeks. Thereafter insulin was withdrawn for four days and a total of 0.642 g. of crude pituitary administered in equally divided doses over the four days. The total lipids, cholesterol, and lipid phosphorus, as well as the ketone bodies, increased to levels greater than those observed in the insulin-deprived depancreatized baboon before hypophysectomy (cf. experiments 13 and 10), but the blood sugar was not elevated to the extreme levels observed in the D.-H. baboons, B. 384 and B. 368, deprived of insulin and receiving only crude anterior pituitary gland (cf. experiment 13 with experiments 3 and 8). B. 386 became gravely ill and died one week later with an intensely fatty liver, despite the administration of cortisone.

Comment

Removal of the hypophysis from a depancreatized baboon does not correct the fundamental defect in carbohydrate metabolism. Moreover, the capacity of the baboon to maintain a hyperglycaemia for a variable length of time after hypophysectomy is dependent on the extent of residual adrenocortical activity. Long-standing hypophysectomy or an induced severe depression of the adrenal cortex following the administration and withdrawal of cortical hormones can lead to severe hypoglycaemia in depancreatized baboons not receiving insulin during short periods of starvation. In such instances the baboon is not apparently able to mobilize glucose from non-carbohydrate sources such as protein or fat, and the blood sugar continues to fall to very low levels. When fed carbohydrate the baboon develops hyperglycaemia, as does a depancreatized insulin-deprived baboon.

In all the experiments cited above, whether or not the baboons received hormone therapy, the severe lipaemia and the ketonaemia could be effectively controlled by the administration of adequate amounts of insulin. This does not mean that every lipaemia is the consequence of a relative or absolute insufficiency of insulin. It has been shown in our laboratory that: (1) thyroidectomy in baboons is associated with a variable lipaemia which can be controlled by thyroxine (van Zyl, 1956) as is the case in hypothyroidism of man (Boyd and Connell, 1936); (2) the administration of cortisone to hypophysectomized or stalk-sectioned baboons results in a moderately intense lipaemia which can be reduced either by withdrawal of cortisone or by the administration of thyroxine even though cortisone therapy be continued (van Zyl, 1956); (3) after the administration of crude anterior pituitary to normal baboons, all the lipid fractions tend to decrease without any accompanying change

in the blood sugar (unpublished data); and (4) castration leads to elevation of all the lipid fractions, which can be reduced by the administration of oestrogen.

In these several experimental situations where adequate supplies of insulin are available, it would appear that an elevation of the blood fats, without an associated ketonaemia, is a function in part at least of adrenocortical activity and some depression of thyroid function. However, the development of a severe ketonaemia is dependent on a measure of insulin deficiency in association with active secretion of somatotrophic hormone (S.T.H.). The regulation of the level of the serum lipids therefore depends, in part at least, on a dynamic relationship between insulin and adrenocortical and thyroid hormones, while the level of the blood ketones is dependent in the main upon a dynamic relationship between S.T.H., insulin, and to a less extent of thyroxine.

The marked individual differences in the degree of lipaemia and ketonaemia described in 15 baboons after pancreatectomy (Gillman *et al.*, 1958a) can be taken to reflect differences in the intensity of participation in metabolism of the adrenal cortex, pituitary, and thyroid in each baboon. When the hypophysis is removed from a depancreatized baboon the individual differences observed in the lipid fractions are minimized. Thus the cholesterol levels in five depancreatized baboons deprived of insulin for four days ranged from 175 to 540 mg./100 ml., whereas after the removal of the hypophysis, associated with a marked reduction in adrenocortical and thyroid activity, the range of the cholesterol values in these same baboons was reduced (152 to 236 mg./100 ml., Table I). Furthermore, by the administration of appropriate endocrine preparations to D.-H. baboons it was possible, in the absence of insulin, to exaggerate the cholesterolaemia (Table II, experiments 7 and 9).

In the terms of the experiments in D.-H. baboons receiving endocrine therapy it is suggested that severe lipaemia with a severe ketonaemia could be attributed to marked adrenocortical activity, active secretion of S.T.H., and possibly to moderate activity of the thyroid (Table III, experiments 3 and 4), while a severe lipaemia and a low ketonaemia might be due to pronounced adrenocortical activity and depressed secretion of S.T.H. (Table III, experiments 5 and 8). A low lipaemia and a low ketonaemia could be attributed to marked depression of the adrenal cortex and thyroid and a corresponding depression of S.T.H. (Table III, experiment 2). Attention is drawn to two additional biochemical patterns—namely, (1) a low lipaemia with a severe ketonaemia and severe hyperglycaemia (Table III, experiment 7), and (2) normal serum lipid levels and normal blood ketone bodies (Table III, experiment 6). The first was produced by crude pituitary in the absence of insulin and in the face of depressed adrenocortical and thyroid activity, and the second by intense thyroid activity with great depression of the adrenal cortex and in the absence of S.T.H.

From the experiments conducted in B. 368, B. 386, and B.384, it can be concluded that in the D.-H. baboon deprived of insulin, (1) cortisone can restore the lipaemia but not the ketonaemia; (2) thyroxine prevents the development of a lipaemia, cholesterolaemia, phospholipaemia, and ketonaemia; (3) cortisone and thyroxine together restore the lipaemia and lead to a slight elevation of the ketone bodies; (4) crude human anterior pituitary alone grossly accentuates the hyperglycaemia, and causes a moderate lipaemia and ketonaemia more intense than that occurring in the diabetic baboon; (5) crude human anterior pituitary in conjunction with cortisone can reproduce the full diabetic picture, which may be even more severe than that observed in the depancreatized baboon before hypophysectomy; and (6) cortisone counteracts the extreme hyperglycaemia induced in insulin-deprived D.-H. baboons receiving crude human anterior pituitary gland.

In our opinion, these several experiments in the baboon may assist in the classification of diabetes on a biochemical basis, with particular reference to the levels of the total lipids, cholesterol, lipid phosphorus, ketone bodies, as well as of the glucose in the blood. The biochemical pattern in turn may disclose to some extent the nature of the endocrine participation in the disordered metabolism.

TABLE III.—*Summary of Effects of Endocrine Therapy on the Lipids, Ketone Bodies, and Glucose in the Blood of Pancreatectomized and Pancreatectomized-hypophysectomized Baboons after a Four-day Period of Insulin Withdrawal*

Expt. No.	Operation	Experimental Treatment	Total Lipids	Cholesterol	Lipid Phosphorus	*Ketonaemia*	*Hyperglycaemia*
1	P		+++	+++	+++	+++	+++
2	P+H		+ or ±	+++	+	±	+++
3	P+H	Cortisone+crude pituitary	++++	++++	+++	+++	+++
4	P+H	Cortisone+crude pituitary+thyroxine	++++	++++	+++	+++	+++
5	P+H	Cortisone	+++	+++	+++	±	+++
6	P+H	Thyroxine	Normal	Normal	Normal	Normal	+++
7	P+H	Crude pituitary	+	+++ or ±	+++ or ±	+++	+++++
8	P+H	Cortisone+thyroxine	++++	++++	+++	±	+++

P = pancreatectomy. H = hypophysectomy. ± very mild, within normal range. + mild. ++ moderate. +++ severe. ++++ very severe.

Summary

Removal of the hypophysis from depancreatized baboons deprived of insulin did not alleviate the hyperglycaemia but did prevent the excessive lipaemia and abolish the ketonaemia. It was demonstrated in depancreatized-hypophysectomized baboons that by the administration of cortisone the hyperlipaemia, cholesterolaemia, and phospholipaemia could be raised to levels greater than those in the same animals before hypophysectomy, but was unattended by ketonaemia.

A saline suspension of acetone-dried human anterior pituitary administered to depancreatized-hypophysectomized baboons scarcely affected the serum lipids but did produce a severe ketonaemia and hyperglycaemia. The complete diabetic picture was reproduced in depancreatized-hypophysectomized baboons by cortisone in conjunction with crude human anterior pituitary.

From a consideration of the relevant data it was indicated that the individual differences in response to pancreatectomy were not only a function of the lack of insulin but of the intensity of participation of the adrenal cortex, of the thyroid gland, and of somatotrophic hormone in the metabolism of each baboon.

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RENAL FUNCTION IN SCLERODERMA

BY

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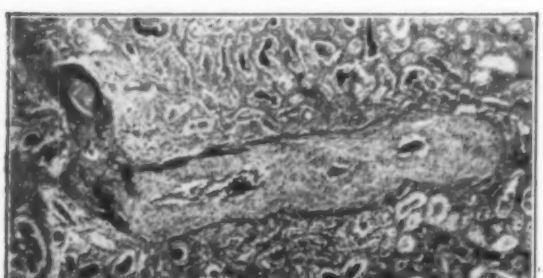
It has been known for some time that changes caused by scleroderma—progressive systemic sclerosis[10]—appear not only on the skin but also in the internal organs, especially the gastro-intestinal tract, lungs, and heart. Only few cases in which the kidneys were certainly involved have been published in the literature, such involvement leading to early death with symptoms of renal failure.[1-9 16-18 20-22 25-34]

Morphology of Kidney

According to Calvert and Owen[6] the morphological pattern of the scleroderma kidney is characteristic. In the proximal part of the interlobular arteries a mucoid thickening of the intima with gross reduction in lumen is seen, whereas in the distal part there is fibrinoid necrosis involving also the arterioles. Depending on the severity of the vascular changes, a more or less pronounced ischaemic necrosis may develop in the renal cortex, constituting what has been called a "true scleroderma kidney."

In the reports mentioned above little evidence is presented to suggest previous renal involvement. From a survey of 150 cases Leinwand *et al.*[19] concluded that until the final phase there is little indication that the kidneys are affected. In the few cases in which a patient suffering from scleroderma died of undoubted renal failure, death usually ensued within one to six weeks of the onset of renal symptoms. In these cases normal laboratory findings (analysis of urine, non-protein nitrogen estimation, creatinine clearance) were followed by an acute deterioration accompanied by the appearance in the urine of protein (albumin), white and red blood cells, and granular casts. The non-protein nitrogen level rose rapidly, as also did the blood pressure, and an increasingly severe oliguria developed. Accompanying the development of azotaemia the hitherto consistently normal blood pressure rose to very high levels (240–260/150 mm. Hg), changes in the optic fundus appeared, and death ensued from anuric uraemia.

During the past three years we have observed 45 patients suffering from scleroderma. In a woman aged 43 fatal renal failure rapidly developed after steroid ("neosterone") treatment had been instituted for polymyositic lesions. While in hospital she suffered from sclerodermal symptoms for about a year. The clinical history in this case, as well as the morphological findings at necropsy, were identical with those described as occurring in scleroderma kidney (see Fig.).



Photomicrograph showing characteristic intimal proliferation narrowing the lumen of an interlobular artery. Peripherally, fibrinoid necrosis predominates in the artery and in the pre-arteriole originating from it. (Endes's combined staining.)

According to Moore and Sheehan,[23] the relation of the special morphological changes to the acutely developing clinical picture should be interpreted as follows. The intimal thickening of the interlobular arteries appears to be the result of a process starting two to four weeks before death. This would gradually lead to a tubular atrophy, coinciding in time with the development of oliguria. The other characteristic morphological change—fibrinoid necrosis of the distal part of the intralobular arteries and of the afferent arterioles—and the consequent cortical necroses, are presumed to develop as late as a few days before death.

Present Investigation

In more than one case the post-mortem examination of patients suffering from scleroderma but who died from some non-renal complication had revealed not only a rather severe mucoid intimal thickening but also a fibrinoid necrosis of the renal arteries without any evidence of impaired renal function.[11 22 29] On the other hand, when analysing the history of our case mentioned above we were struck by the fact that, despite normal findings in the urine, the effective renal plasma flow (R.P.F.), as measured by the P.A.H. clearance test ($C_{P.A.H.}$), was reduced as compared with the normal and the filtration fraction (F.F.) was increased. Thus it seems reasonable to assume that scleroderma—progressive systemic sclerosis—producing changes in most of the internal organs, would also affect the kidneys, and the characteristic pattern of "true scleroderma kidney," instead of developing only at the terminal stage, might have its origin in some earlier renal affection.

We assumed that the use of more sensitive tests might reveal more or less marked pathological changes in renal function before signs of renal involvement were detectable by clinical methods. To elucidate this point 25 patients suffering from scleroderma of varying degrees of severity were tested for R.P.F. by the P.A.H. method and for glomerular filtration rate (G.F.R.) by the endogenous creatinine clearance ($C_{Cr.}$) method, and from these the F.F.s were computed. In general, averages were taken of data obtained from blood tests made at the beginning and end of each clearance period. In cases where the withdrawal of blood was difficult, samples were taken halfway through the period, it being considered that, as the level of P.A.H. was constant, this would not endanger accuracy. Determinations, representing the beginning of clearance periods, were made 20 minutes after the infusions were started. At the beginning of the infusions patients received 200–500 ml. of water to induce hydration. The length of a single clearance period depended on the volume of diuresis; usually periods of 15–20 minutes were found satisfactory. With a few exceptions each case had two to three clearance periods, and if the results agreed sufficiently well they were evaluated. Creatinine clearance was estimated by the method of Popper, Mayer, and Mandel, and P.A.H. clearance by that of Bratton and Marshall.

In order to facilitate evaluation of the data obtained values were corrected to 1.73 sq. metres of body surface, surface area being calculated from weight and height, with the help of appropriate tables, in the usual manner. The filtration fraction was computed from the equation C_K $C_{P.A.H.}$100. The results are summarized in the Table.

It will be seen that only two of the 25 patients had $C_{P.A.H.}$ values which could be accepted as normal. Clinically, these two cases were the least severe, exhibiting "acro-sclerosis" of short duration. In three cases the reduction in $C_{P.A.H.}$ was moderate and in six cases average, while in 14 cases $C_{P.A.H.}$was much reduced (150–300 ml. per minute). In 23 of the 25 cases the G.F.R. as measured by $C_{Cr.}$ was within normal limits, and in the other two cases it was only moderately reduced.

No unidirectional, unequivocal correlation could be established between the results of renal function tests on the one hand, and the duration, severity, and extent of the clinical disease on the other.

Conclusions

From the above results two conclusions can be drawn.

1. The reduction in R.P.F. indicates the presence of sclerodermal changes in the kidneys long before the usual clinical tests, including analysis of the urine, would show any sign of renal involvement. Obviously, the arterial changes observed histologically (thickening of the intima, narrowing of the lumen to fibrinoid necrosis) are responsible, at least in part, for the reduction in the R.P.F.

2. Whereas $C_{P.A.H.}$ was reduced in more than 80% of the cases, the G.F.R. was normal in all but two. Consequently the F.F. would be expected to be greater. Indeed the F.F. was much increased in 19 out of the 25 cases. This indicates that in these cases the anatomical changes in the preglomerular arteries were associated with spasm of the efferent vessels. Similar phenomena can be observed in cases of impaired renal function due to other causes than scleroderma.[12–15 22 24]

Thus it can be assumed that in patients suffering from scleroderma, also, the spasms accompanying the anatomical changes serve as a compensatory mechanism aimed at the maximum possible maintenance of glomerular function in the presence of renal vascular lesions. This would explain

Results of Renal Function Tests in 25 Cases of Scleroderma

Case No.	Sex	Age (Years)	P.A.H. Clearance (ml. per minute)		Creatinine Clearance (ml. per minute)		Filtration Fraction
			Actual	Calculated per 1·73 sq. m. Body Surface	Actual	Calculated per 1·73 sq. m. Body Surface	
1	F	19	560 560	616 616	96 83	106 91	17 15
2	F	43	520 505	666 648	97 100	124 128	19 20
3	F	59	416 448	532 574	77 83	99 106	19 19
4	F	42	457 420	560 516	106 96	130 118	23 23
5	F	43	415 415	532 532	90 74	115 95	22 18
6	M	49	435 392 393	502 452 453	105 100 95	119 115 110	24 25 24
7	F	19	374 374 350	446 446 418	92 92 88	110 110 105	25 25 25
8	M	47	396 373	426 400	110 87	118 93	28 23
9	F	48	380 312	487 397	110 88	140 112	29 28
10	F	44	344 394	379 433	84 114	93 125	24 29
11	F	49	294	403	71	98	24
12	F	42	390 340	427 372	90 85	98 93	23 25
13	F	52	298 292 254	380 372 323	85 78 71	108 99 91	28 27 28
14	F	44	390 320	385 316	104 92	103 91	27 29
15	F	57	280 274 270	328 321 316	79 79 82	92 92 96	28 29 30
16	F	37	298 276	331 306	103 99	114 110	34 36
17	M	59	308 267 210	398 347 273	83 75 65	108 98 85	27 28 31
18	F	50	244 268 262	303 331 324	88 89 77	109 110 95	36 33 29
19	F	59	343 306 300	353 315 309	99 88 94	102 90 97	29 29 31
20	F	57	296 314	380 405	91 74	117 96	31 24
21	F	53	320 270	406 342	109 87	141 110	35 32
22	F	40	224 260 240		64 72 97		29 28 40
23	F	42	204 155	283 216	40 35	55 49	20 23
24	F	60	230 204	263 234	74 70	85 80	32 34
25	F	26	150 127 107	175 148 124	51 49 48	59 57 56	34 38 48

why the usual clinical tests fail at an early stage, and may even fail completely, to show the presence of diseased kidneys. Once this equilibrating mechanism is upset, for whatever reason, renal function will rapidly deteriorate and uraemia develop. The morphological manifestation of this train of events constitutes what has been termed a "true scleroderma kidney."

Summary

In a small percentage of cases scleroderma produces characteristic morphological changes in the kidney. These consist of mucoid proliferation, accompanied by gross reduction in lumen, of the proximal parts of the interlobular arteries, while the distal parts of these arteries exhibit a fibrinoid necrosis extending to the arterioles. In the parenchyma of the renal cortex ischaemic necroses occur.

The case is reported of a woman aged 43 who developed acute renal failure shortly after the institution of steroid therapy for polymyositis. The renal histology followed the pattern seen in "true scleroderma kidney."

Out of 25 patients suffering from scleroderma of varying severity 80% showed a reduced $C_{P.A.H.}$ (for the estimation of R.P.F.), normal $C_{Cr.}$, and increased F.F. From this it is concluded that the finding of a reduced R.P.F. furnishes an earlier indication of sclerodermal renal involvement than do the commonly used clinical tests.

Reduced $C_{P.A.H.}$, normal $C_{Cr.}$, and increased F.F. indicate that the anatomical changes in the preglomerular arteries are accompanied by spasm of the efferent vessels. The presence of a compensatory mechanism serving to maintain, so far as possible, maximum glomerular function in the presence of a diseased renal vascular system is suggested.

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ONSET ENURESIS

BY

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No distinction is usually made between those enuretics who have always been wet at night and those who have once been dry and then have subsequently recommenced bed-wetting (onset enuresis). This report describes a study of children with onset enuresis in two practices on a post-war L.C.C. housing estate. The practices are similar in all respects and are contiguous geographically.

Case Finding

During the years 1950–5, 24 children with onset enuresis were brought for advice in the normal manner to one of us (J. D. P.), it being known among his patients that he was "interested" in the problem of enuresis.

On the N.H.S. list of the other of us (E. T.) there were on January 1, 1955, 317 families with a child or children under the age of 21, the family sizes being as shown in Table I. The total number of 677 children consisted of

TABLE I.—*Family Size*

No. of children in family	1	2	3	4	5	6	7	10
No. of families	101	137	50	13	8	2	4	-

331 girls and 346 boys. During the year 1955 the mother of each family was personally interviewed by E. T. and asked in respect of each child the age at which it had become dry at night, and the details of any relapses; and, in the case of those still wet, whether there had been any bouts of dryness, when these had occurred, and how long they had lasted. The incidence of enuresis (this being defined as one or more wet beds a week) revealed by this survey is shown in Table II, and is similar to that in previously published

TABLE II.—*Incidence of Enuresis*

Age in yrs.	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12	-21
No. of children	25	24	42	48	60	66	70	64	50	35	37	15	141
No. still wet ..	25	21	27	12	13	9	9	6	7	0	3	2	4
Percentage still wet	100	87	64	25	22	13	13	11	14		6		3

reports (Bransby, Blomfield, and Douglas, 1955; Blomfield and Douglas, 1956). Of the 478 children of 5 years of age or over, 438 were dry at the time of questioning. The ages at which they had become dry at night are shown in Table III

TABLE III.—*Ages When Becoming Dry*

	No. of Children	Percentages at Years:					
		1½	2	2½	3	4	5
First child	268	28	55	72	76	82	88
Second child	144	28	55	71	74	81	86
Third and subsequent children	66	57	77	87	88	91	93
All children ..		33	59	75	79	85	87

as a percentage of each age group according to birth order. Of the 31 children over the age of 6 who were still wet, 9 (29%) had previously been dry for at least three months, the average period of dryness being two years. In addition, 11 children, dry at the time of questioning, had had relapses

lasting between two months and four and a half years, after having been dry for at least three months.

There were thus 20 cases of onset enuresis revealed by the survey, and these with the 24 cases from the practice of J. D. P. gave a total of 44 cases available for study.

Aetiological Features

Eleven (25%) of the 44 children came from families which showed overt instability, and the onset was coincident with a family crisis—divorce, separation, or remarriage.

The other 33 cases occurred in apparently normal ordinary families, and in six of these there was at the time of the onset an obvious associated experience such as the child going into hospital or removal of the family to another area. In the remaining 27 cases, however, there had been no apparent disturbance in the family's or the child's routine, and the only discernible alteration in the child's circumstances at the time of the onset was that either the mother was pregnant or she had been confined during the previous nine months.

That this association between onset enuresis and a maternal pregnancy cannot be attributed to chance is shown by estimating the probability of such an association in children of the same age as the enuretics. In the same practices, at the average age (4 years) of the children with onset enuresis, the expected association of a maternal pregnancy was about 7%, while the actual association with all onset enuretics was 60%, and, excluding those cases explained by divorce, separation, or remarriage, the association with a maternal pregnancy rises to 80%.

The relationship between the events—pregnancy, confinement, and onset enuresis—is shown in Table IV. As can be seen, onset enuresis in the firstborn associated with

TABLE IV.—*Association Between Onset Enuresis in Child and Occurrence of Pregnancy in Mother*

	Months Pregnant									Months After Birth											
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	10	11	12
Second Pregnancy			1							1 1 1 1	1			1	1 1 1			1			
Third Pregnancy			2 1 1												2 2 2 2						
Fourth Pregnancy			2 2 3											3	2						
Fifth Pregnancy			1 2					4													

1 = Onset in first child. 2 = Onset in second child. 3 = Onset in third child. 4 = Onset in fourth child.

a second pregnancy occurs either immediately after the birth or when the infant is about 6 months old. With a third pregnancy, either the first or the second child is affected, the onset tending to occur in the first trimester of pregnancy rather than after confinement, and this was even more pronounced when the onset was associated with fourth and fifth pregnancies. With all birth orders, cases occurring after the birth of the baby tend to congregate in the fifth and sixth months, when the risk of further pregnancies is being realized by the mother and her anxiety is communicated to the child.

It is not necessarily the youngest, and therefore the child most dependent on the mother, who develops onset enuresis; with the fourth and fifth pregnancies it was still the first and second in the family who were most often affected. Thus it appears that first and second children are in some way different from children born later, and this is confirmed by the fact that third and subsequent children learned to master bladder control at a significantly earlier age than first and second children (see Table III).

The explanation may be that the first two children have an "individual" relationship with their parents and compete with each other for parental regard, while the parents discriminate openly between their behavioural performances. But if there are three or more children the tendency is to treat them as a group which must submit unreasonably to parental authority. Third and subsequent children coming into such a sibling group have from their earliest days a behavioural reference group which is childish and uncritical, and from which it is easy to learn the elements of domestic behaviour. This learning may be made even easier by the mother's increased skill with third and later children.

Treatment and Results

The mothers who came to J. D. P. for advice were given interviews at which they discussed with the doctor the problem of the onset enuresis in their children. The number of interviews varied from three to six and the total time spent at them averaged about two and a half hours. The content of these interviews is discussed below. The children were not seen.

Of the 27 cases associated with pregnancy, 13 occurred in the practice of J. D. P. and were treated as described above. As a result of this treatment, all the children became dry and had remained dry when followed up two years later. The average time taken to become dry is shown in Table V

TABLE V.—*Results of Treatment*

	No. of Cases	Age First Dry (Av.) Years	Age at Onset (Av.) Years	Age When Resolved (Av.) Years	Duration of Onset (Av.) Months	No. Unresolved
Untreated ..	14	2·0	4·0	6·5	29	6
Treated ..	13	1·10	3·9	4·6	9	0

and is compared with information obtained for the 14 children revealed by the survey of E.T. as having had onset enuresis in association with a maternal pregnancy.

The untreated group is not strictly a control group, but is nevertheless comparable, as the children came from similar backgrounds and the age at which they first became dry and the age at which the onsets began were similar. The only difference between the two groups was in sex distribution, the treated group having a preponderance of girls. A worse prognosis in girls would therefore have produced a bias. This, however, is unlikely, as onsets did not occur more often in girls, sex bore no relationship to the age at which children became dry, and the occurrence of precipitating factors showed no correlation with the sex of the existing children.

Discussion

The children studied here were in families which sprang from the socio-cultural stock of the older London boroughs. The parents had been nurtured in circumstances very similar to those described by Young and Willmott (1957) in Bethnal Green, and would be classed by Elizabeth Bott (1957) as families showing a "close-knit kinship network and segregated conjugal roles." The organization of this type of family presumes the acceptance of fixed social norms which are a reciprocal function of fixed occupation; men's work is outside the home, women's work within the home. In such a "status" family the wife submits to her husband's sexual needs, accepts his economic support, bears her children without complaint, and loves them uncritically and without discrimination.

The emotional values of status families contrast in all situations with those of the families described by Bott as showing a loose-knit kinship network and shared conjugal roles. Such "mobile" families accept the occupational emancipation of both men and women and its consequence on interpersonal relationships. They are critical of performance in their work, in their social relations, in their personal relations, and in conjugal partnership. They determine the number of their children by a critical assessment

of their own emotional, social, and economic potential to give their children all they "need." They strive to create one or two competitively successful children rather than a gregarious egalitarian sibling group.

As Bott has observed, these family types probably represent extremes in a continuum along which most families are transitional or intermediate in their organization. The families with children exhibiting onset enuresis may have functioned well within the socio-cultural milieu of a status family network in their native London borough, but, at the same time, the parents' experiences at school, and subsequently at work, and the influence of radio, television, cinema, and magazines, denigrate status values and encourage mobile values. But until rehousing and the physical separation from the native borough have occurred such tendencies have been prevented from becoming manifest. The adjustment to mobile values after rehousing is difficult, and, because of this, 25% of the original families on the estate returned to their native boroughs in the first two years. Of the remainder, 70% manifest psychoneurotic ill-health (Paulett, 1956), and, as Martin, Brotherston, and Chave (1957) have shown in a similarly rehoused population, the actual rate of admission to hospital for psychoneurotic disorder shows a significant excess over the expected rate.

If our assessment is correct, the critical emotional conflict will be focused on the determination of family size. If the number of children can be limited to two, then the mother will be able to resume work when the children are at school, secure a degree of occupational and economic independence, and create a family which functions on mobile values.

There can be no doubt that the mothers of children developing onset enuresis in association with pregnancy wished at all costs to avoid repeated pregnancies. They were quite aware of the effect of overbreeding in their own parents' generation and were determined to do more for their children than had been done for themselves. They had mostly entered marriage knowing that "people did not have so many children nowadays," but were quite unaware of the practical or the emotional problems they would have to face in achieving this end.

In discussing with the mother her child's enuresis, this sociological approach to the problem was taken. It was explained that even such an acute personal problem can result from the change in the way of life of her family and of the stress of her new social situation. She need not feel guilty about doing things differently from the way her mother did them, and the best practical solution was to utilize those emotional values compatible with a mobile family organization.

We have shown that the prognosis of onset enuresis can be improved by the treatment outlined above, and it may well be that a more traditional mode of treatment would have achieved the same results. A search through the literature, however, fails to reveal any report of treating enuresis which compares results in treated and untreated groups.

There is also no information in the literature on the prevalence of the onset type of enuresis, and the present study shows an incidence which is perhaps higher than would be expected. This is probably due to specific emotional conflicts within family life, which, while characteristic of our culture, are most clearly seen in rehoused urban communities.

Summary

Forty-four cases of onset enuresis were studied.

The precipitating factor in most cases was a maternal pregnancy.

A sociological approach was taken in discussing the problem with the mothers.

Using untreated cases for comparison, such an approach is shown to be effective in treatment.

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TREATMENT OF NOCTURNAL ENURESIS BY THE ELECTRIC ALARM

BY

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Eight years ago Davidson and Douglass (1950), using the method described by Mowrer and Mowrer (1938), reported on the treatment of 20 severe cases of enuresis by means of an electric alarm, but, though they obtained a high rate of cure, the method has not been widely adopted.

It has been employed locally for the past two years. During the first year four general practitioners treated 52 enuretics; then a clinic was established to which any doctor could refer his patients, and a further 48 were so treated. This paper records the results of treatment of 100 enuretics aged 3½ to 21 years (64 male and 36 female) and puts forward an explanation of the mechanism by which the electric alarm works.

Apparatus

The apparatus (Fig. 1) consists of a pad bearing spirally arranged metal electrodes which lies on the mattress under a drawsheet and is connected by a flex to a bedside bell activated by a 4½-volt dry battery. Contact of urine with

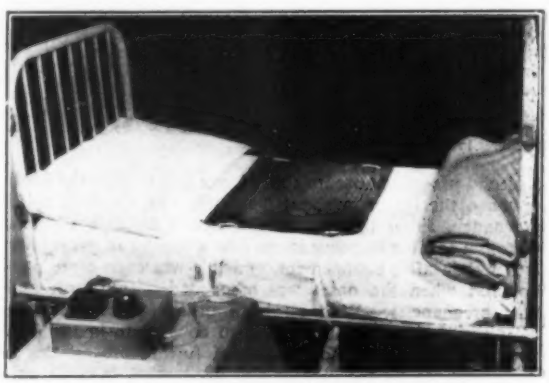

FIG. 1.—Apparatus in position.

the pad closes an electric circuit and rings the bell (the sensitivity is such that 5 ml. of urine will ring the bell); this awakens both mother and child. The child rises and empties his bladder, while the mother fixes a fresh dry section of drawsheet over the pad.

It might be thought that this technique merely prevents the bladder emptying completely, thus converting a soaking wet bed into one containing a small damp patch. Not only

does it do this (for which the mother is most grateful), but in most cases, after a period of several weeks, bed-wetting ceases altogether.

The Clinic

The clinic, staffed by members of the local branch of the Red Cross, is held one evening a week on church premises. Patients are treated only at the request of their family doctor and are seen by appointment. On an average two new cases are interviewed each week, along with follow-ups from previous weeks. This necessitates an initial outlay of about two dozen sets of pads and bells. A hire charge of two guineas, waived in cases of hardship, covers the running costs of the clinic.

Work is limited to treatment with the electric alarm, and prior investigation is left to the discretion of the patient's own doctor, who has been previously circularized to this effect. Since the clinic is held in the evening, the younger patients are frequently never seen, the parent acting as intermediary; this, however, has had no noticeable adverse effect upon the results obtained.

At the first visit the apparatus is supplied to the parent, or patient, after demonstrating its use. Parents are advised not to lift the child when they retire or to restrict fluids. They are given a card on which to record wet and dry nights and are warned to expect many disturbed nights during the first fortnight.

Further visits are at fortnightly intervals. When the patient has remained dry for not less than a fortnight (in practice it averages at over three weeks) the apparatus is returned and the family doctor notified of the result. The parent is assured that, should the child relapse, treatment will be immediately available without further charge.

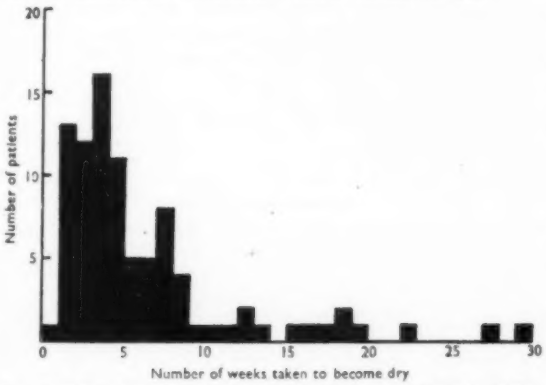

FIG. 2.—Number of patients who became dry each week while using the electric alarm in relation to the number of weeks taken to effect a cure. Total number of patients, 90.

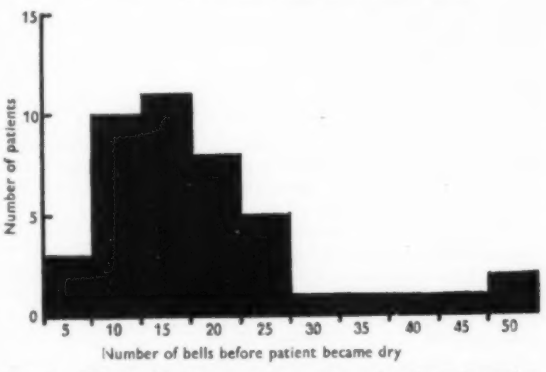

FIG. 3.—Relationship between the number of patients becoming dry and the number of bells which rang before they became dry. In addition one patient became dry after 71 bells and another after 95 bells. Total number of patients, 45.

Results

Ninety out of 100 patients recovered while on the pad and bell, 53 in 5 weeks or under, 76 within 10 weeks. The proportion becoming dry when treated by their own doctor did not differ significantly from that at the clinic. Fig. 2 shows that this pattern of recovery was not entirely haphazard, for of the 76 who became dry in 10 weeks there was a peak recovery rate of 16 in the fourth week, dropping on either side down to 1 in the first and tenth weeks respectively.

An even closer relationship might well exist between the number of patients becoming dry and the number of bells which rang before they did so. The available data for this are limited to 45 patients treated at the clinic. Results are shown in Fig. 3. It will be seen that 38 out of 45 (84%) became dry after the ringing of from 1 to 30 bells. Here again a similar pattern appears, the number of recoveries rising from 3 after 1–5 bells, up to a peak of 11 after 11–15 bells, dropping down again to only 1 after 26–30 bells. This pattern is more in keeping with the response to some specific therapeutic process than to mere chance or even to the results of suggestion. It is worth noting that in no instance was there recovery without the ringing of a single bell.

TABLE I.—*Comparison of Results of Treatment of 100 Enuretics in Different Age Groups*

	Under 5 Years	5 to Under 10	10 to Under 15	15 and Over
Dry within 5 weeks ..	12 (63%)	32 (58%)	7 (39%)	2 (22%)
,, 10 ,, ..	14 (74%)	45 (82%)	13 (72%)	5 (56%)
,, 30 ,, ..	14 (74%)	52 (95%)	17 (94%)	7 (78%)
Failed	5	2	1	2
Total ..	19	54	18	9

Age.—Table I relates response to age. It will be seen that the majority of patients in each age group eventually became dry, the younger patients (though there were several failures) responding the quickest. It was gratifying to find that in spite of years of persistent bed-wetting many of the older patients also responded to this treatment.

Diurnal Symptoms

Where diurnal symptoms such as frequency, urgency, or diurnal enuresis coexist, it is usual for these symptoms to subside *pari passu* with improvement in the main complaint.

Case 1.—Girl aged 4. Wet every night since birth. Mother brought the child for treatment on account of excessive frequency of micturition, urgency, and frequent wetting by day. She had had to change the knickers 13 times in the two days prior to seeing the doctor. Five months of treatment by a prescribed regime, together with medicine and tablets, produced little improvement by day, and she had about one dry night a month. She was then put on the pad and bell and showed immediate response. In 22 nights she became completely dry and could go for as long as 12 hours without passing urine. Her daytime symptoms also vanished. She has remained dry for over two years.

Case 2.—Girl aged 6. Wet every night since birth. Wet also by day, requiring several changes of knickers; these were always soaking wet when she returned from school. The condition was so severe that the question arose whether she should first of all see a urologist. She was, however, given a trial of the pad and bell with the intention of referring her if there was little response. She became dry at night in six weeks, and her mother reported that she was also dry by day, though still with a mild urgency of micturition.

Severity

Of the 100 patients, 74 were reported as wetting the bed every night (sometimes two or three times a night), the remaining 26 less often. It might be thought that those who already had some dry nights and thereby showed some measure of control would become continent more readily than those who wet every night. This was not so (Table II). At the end of five weeks 59% of the "every nighters" had become dry, compared with 35% of the intermittent wetters,

TABLE II.—*Comparison of Results of Treatment of 74 Enuretic Children who were Reported as Wetting the Bed Every Night with 26 who Wetted Less Frequently*

	Wet 7 Nights a Week	Wet Less than 7 Nights a Week
Dry within 5 weeks	44 (59%)	9 (35%)
,, 10 ,, ...	56 (76%)	19 (73%)
,, 30 ,, ...	66 (89%)	24 (92%)
Failed	8	2

though ultimately both groups became dry to the same extent. Possibly the greater number of bells experienced by the "every nighters" at the outset produced their more rapid response.

Case 3.—Boy aged 6. Wet every night since birth. Bell rang 20 times the first week (a record for the clinic), six times the second week, and twice the third week; thereafter he remained dry.

Case 4.—Boy aged 9. Enuretic since birth. Reported to wet the bed about four times a week. However, for the 12 weeks he was on the electric alarm the number of bells a week was as follows: 1, 2, 2, 1, 1, 2, 0, 0, 1, 0, 0, 0.

Thus Case 3 had 28 bells but became dry within three weeks, while Case 4 had only 10 bells, yet took nine weeks to achieve full continence.

Enuretics Previously Continent.—Eight patients were reported as having previously become continent and then relapsed. Six of these (75%) became dry in 10 weeks, a figure almost identical with the whole group (76%).

Deep Sleep

Braithwaite (1956), Ström-Olsen (1950), and others have stressed the importance of deep sleep in enuresis. Of the patients treated at the clinic, seven were found to be such deep sleepers that they were given amphetamine to enable them to rouse to the bell; another eight failed to rouse at first, but later responded without the use of sleep-lightening drugs; the remainder woke to the bell from the outset.

Of those at the clinic who became dry within 10 weeks, only 2 out of 36 (6%) required amphetamine, whereas of those who took more than 10 weeks, or who failed to become dry, 5 out of 12 (42%) were given the drug. The impression gained, therefore, was that abnormally deep sleep was not present in the majority of enuretics, but that when present it tended to retard recovery. Three patients among those treated by the doctors are continuing to take amphetamine to prevent relapse.

Nocturnal Polyuria

It has been maintained that an enuretic child secretes more urine at night than his bladder can reasonably hold—nocturnal polyuria—and that this is a major aetiological factor (Poulton and Hinden, 1953). This is not borne out in the present series. Although all children were allowed free fluids at bedtime, and though they were not lifted when the parents retired, the majority after becoming dry were able to sleep undisturbed throughout the night, thus proving that their bladders were by then capable of retaining a whole night's urine. Further, test measurements in about 20 cases, made at the time of actual wetting, showed that the bladder is generally less than half full when wetting occurs. Even where nocturnal polyuria exists it is not necessarily the main aetiological factor.

Case 5.—Boy aged 10. Enuretic since birth. Wet six nights out of seven. Became dry in two weeks on the pad and bell. His mother measured the night urine for four weeks. It averaged 15 oz (450 ml.) a night, occasionally reaching 20 oz. (600 ml.). He woke and rose in the night to pass water. Later he relapsed. Further measurements over 18 nights now showed an average of 5 oz. (150 ml.) a night, with a maximum of 8 oz. (240 ml.). Thus he became dry while secreting 15 oz. (450 ml.) a night, yet relapsed and was enuretic while passing only one-third of that amount.

This case also illustrates that nocturnal polyuria is not necessarily a permanent condition.

The pad-and-bell treatment also supplies information on the time and frequency of bed-wetting. Sometimes improvement can be recognized because wettings have dropped from twice to once nightly, sometimes because they have become progressively later in the night, though often, it must be admitted, the pattern appeared quite haphazard.

Failures and Relapses

There were 10 failures. This includes three who were much improved, being dry five to six nights a week, whereas formerly they were wet every night. Of the remainder, three failed to co-operate, one never woke when the bell rang, and one ceased treatment after four weeks on account of a buttock rash.

It is not surprising that in a recently acquired control of this sort there should be occasional relapses. Most relapses occurred within the first few weeks or early months of becoming dry. Eleven patients relapsed but became dry after a further course of treatment. Two relapsed three or four times but responded to further sessions with the pad and bell. Such relapses would suggest, however, some complicating factor such as abnormally deep sleep or emotional tension.

As there is no systematic follow-up scheme there may well be rather more relapses than are here recorded, particularly of the mild or partial variety; but, since all are invited to return if relapse ensues, and informal contact is often made between clinic workers and ex-patients, it is not thought that severe or complete relapses are much in excess of the figure given. An isolated "accident" in the early weeks of continence is not regarded as a relapse.

Response to a second or later course of treatment is variable; sometimes it is shorter than the original course, sometimes longer.

It so happens that all relapses occurred in patients enuretic since birth, none in the small group previously continent; this is probably purely coincidental. However, if psychological factors played a big part in the causation of this latter group and were still operative one might well have expected a greater tendency for those patients to relapse; in point of fact none of them did.

Psychological Effects

No adverse psychological effects, or substitution symptoms, have been observed either during or subsequent to treatment. Indeed, parents have spontaneously remarked how much brighter and happier the child has been since he became dry. This corresponds with the observations of the psychologists Mowrer and Mowrer (1938), who reported: "Personality changes when they have occurred have uniformly been in a favourable direction. In no case has there been any evidence of symptom substitution."

We know of no published evidence which refutes this view. Even in the occasional case where a psychological factor has triggered off the condition, the electric alarm may prove more effective than psychotherapy.

Case 6.—A boy aged 13 started to wet his bed at the age of 6 following the death of his mother. Six months' therapy at a London clinic for nervous disorders and two years at a London teaching hospital produced no results, yet after five weeks on the pad and bell he became dry and has remained dry ever since (six months). He was reported as being much brighter and happier and looking forward to going to camp for the very first time.

Psychologists have stressed the purely hypothetical and unproved dangers of curing this symptom; they sometimes seem to turn a blind eye to the very real danger of psychological harm that may arise as a result of not curing it.

Buttock Rash

Mention must be made of a complication which sometimes occurs—namely, a rash on the thigh or buttock. It appears to be due to electrolysis of sodium chloride in the urine with the production of sodium hydroxide at the

cathode. Normally the bell rings within a second or two of wetting the drawsheet and electrolysis is insignificant. If, however, for any reason the bell fails to ring, then a small but continuous current passes through the pad and electrolysis occurs. The rash produced may consist of a number of red papules, but many show definite punched-out superficial ulcers, presumably chemical burns, which, while often mild and generally painless, can at times be more severe and slow to heal.

Eleven out of 48 (23%) treated at the clinic developed a rash to some extent, but in none did it result in stopping treatment. A roughly similar proportion of rashes are considered to have occurred among those treated by their own doctor, and in one instance this led to abandonment of treatment.

Our present routine is to advise the use of a doubled drawsheet over the pad and the dusting of boric powder to neutralize any soda produced. This appears to have lessened the danger, for since adopting this procedure there have been only two further cases, both mild, out of a total of 37 patients treated or still receiving treatment.

Discussion

While no theory of enuresis has yet met with general acceptance, the fact that 9 out of 10 enuretics have continued to wet their beds since birth would seem to support the view that it is mainly a failure of development—a failure, that is, to substitute cerebral control for the spinal control of infancy. A likely explanation is that in enuretic children bladder sensations are not adequately perceived during sleep at cerebral level, consequently the appropriate efferent inhibitory impulses are not forthcoming.

Strong support for this view comes from a consideration of the electric-alarm treatment, for all that this does is to waken the patient in the act of passing urine. Micturition centres normally controlling the inhibitory reflexes are thus roused at the very moment when bladder sensations are at their height, the detrusor is in full contraction, vesical tension is maximal, and, for good measure, there is a distended urethra with a flowing current of urine. Response is almost instantaneous—inhibition occurs *before the patient is fully awake*. This is the key to an understanding of how the method works, for it is an *unconscious inhibitory reflex* that needs developing; the moment conscious voluntary control takes over, the inhibitory mechanism is suppressed. Fortunately there is apparently this small fraction of time in which the lower cerebral centres are alerted before the higher centres have become fully awake; and by repetition night after night this inhibitory reflex is strengthened until in most cases it becomes firmly established.

Proof that the response is reflex and unconscious takes several forms, for not only is the size of the patch only just sufficient to cause the bell to ring, thereby indicating that the response must have been almost instantaneous, but older patients, when questioned, admit that when they wake they do not consciously have to inhibit the act—this has already occurred. At the other end of the scale young children are known whose wet patches after the bell has rung have been minimal, yet they have become dry without ever fully rousing on any night until lifted by their mothers.

Once it is conceded that the defect in most enuretics is a weakness of this inhibitory reflex and that the electric alarm achieves its results by strengthening that reflex, then this at once becomes the most logical—indeed, the most physiological—method of treatment.

It is unfortunate that the usual explanation of how this method works is that it is the result of a "conditioned reflex" (Mowrer and Mowrer, 1938). This is untrue, and leads to such erroneous statements as that "the bell conditions the child to wake to a full bladder." It does nothing of the sort. Neither is the bladder full at the time of wetting nor does the bell train the child to wake; if it trains him to do anything at all, in most cases it trains him to sleep continent and undisturbed throughout the night.

The term "conditioning apparatus" is therefore inaccurate and misleading, and should be abandoned; it befogs the issue by failing to make clear that we are here dealing with the establishment of a normal physiological inhibitory mechanism.

All published accounts of electric-alarm treatment report a high proportion of recoveries: Mowrer and Mowrer (1938) 30 out of 30; Davidson and Douglass (1950) 15 out of 20; Crosby (1950) 46 out of 52; Geppert (1953) 38 out of 42; Seiger (1952) 94 out of 106. A method, therefore, that produces such a high rate of recovery, that achieves its results in such a short space of time, and is so complete that in most cases no restrictions of any sort are required to prevent recurrence must surely be getting very near to the heart of the matter. If psychological factors were paramount one would not expect this striking rate of recovery from the mere ringing of a bell; it is also significant that, although warnings have from time to time been sounded regarding possible dire psychological harm that might result from this method, no single example of this sort, to the best of our knowledge, has yet been published.

The time may, therefore, well be ripe for others with wider experience and greater facilities to reassess the place of the electric alarm in the treatment of enuresis; those, for instance, familiar with cystometrograms might well demonstrate whether an enuretic who showed the low-volume high-tension bladder of infancy, with numerous uninhibited contractions (Ellison Nash, 1949), developed, after responding to the electric alarm, into the large-volume low-tension bladder of maturity.

Finally, a word about cost. While effectiveness of treatment rather than cost should be the main criterion, a word on this subject may not come amiss. A commercial firm is charging 25 guineas merely for the loan of the apparatus: this is quite unnecessary, as there are at least three firms in this country who will sell it outright at prices from 6 to 10 guineas. The cost can be reduced still further if treatment is run from a clinic where the alarm unit can be loaned, the cost then becoming little more than that of the pad, which varies according to make from 1 to 3½ guineas. Cost, however, is not the only argument in favour of running treatment mainly from a clinic. It must be freely admitted that there is a good deal of fuss and bother over the distribution, care, and maintenance of the apparatus and that it is better handled by those familiar with the method and with adequate spare equipment. Most doctors would co-operate freely by referring their patients to such a clinic; many might well hesitate to initiate it on their own account. Results, too, tend to be better where regular methodical supervision is maintained, and this is more likely to be achieved at such a clinic.

It would thus seem possible to reduce the problem of enuresis, which at present looms large in most children's out-patient departments, to one of much more modest proportions, and once the back-log of older enuretics had been dealt with—itself a reflection of the failure of present methods—the numbers for future treatment would become greatly reduced, consisting largely of the annual influx of new patients of pre-school age.

Summary

A report is given on the treatment in their own homes of 100 nocturnal enuretics by means of the electric alarm. Their ages ranged from 3½ to 21 years. More than half of them became dry within 5 weeks, three-quarters within 10 weeks, and 90 within 30 weeks. A theory is submitted concerning the nature of the defect in nocturnal enuresis and of the way the electric-alarm treatment corrects this defect. It is suggested that treatment is best administered from a clinic.

We thank the Ilkeston (Derby 16th Detachment) branch of the British Red Cross and in particular Mesdames Riley, Meakin, and

Fisher, for their invaluable help in running the clinic; and Mr. E. S. McLeod, of the Department of clinical photography, Nottingham General Hospital, for providing the photograph of the apparatus. The bulk of our equipment was obtained from the Orphan Homes of Scotland, Bridge of Weir, Renfrewshire, but it may also be obtained from N. H. Eastwood, 5, Farmleigh, Southgate, London, N.14; and from Down Bros. May and Phelps, of New Cavendish Street, London, W.1. The pads and alarm units of these makers differ considerably.

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VISUAL DISTURBANCES ASSOCIATED WITH TRIVALENT ANTIMONY SALTS

A REPORT OF TWO CASES

BY

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The causes of optic neuropathy are almost legion. Duke-Elder (1940) has classified them as follows.

1. Local inflammatory conditions.
2. General inflammatory conditions: (i) central nervous (? virus) infections; (ii) syphilis; (iii) tuberculosis.
3. Leber's disease.
4. Endogenous toxins: (i) acute infective disorders; (ii) septic foci (teeth); (iii) metabolic (deficiency diseases).
5. Intoxications by exogenous toxins: tobacco, methyl and ethyl alcohols, lead, arsenic, thallium, apiol, quinine, ergot, optochin, felix mas, aniline.

The condition is fortunately uncommon in Kuwait. If one excludes cases associated with proved intracranial neoplasm, hypertension, or nephritis, only two examples have been seen in the native population during the 10 years or so in which the company has been developing its medical services. During 1957 about 500 patients were seen daily at the out-patient clinics.

Case 1

This patient was a young man about 25 years old. He was well nourished and of fair physique. He had had repeated attacks of left-sided renal colic, and urinary schistosomiasis was first diagnosed at the beginning of September, 1956. His weight was 120 lb. (54.4 kg.). Routine physical examination revealed nothing abnormal, and he was given five intravenous injections of 12 mg. of sodium antimony tartrate at 12-hourly intervals, with lucanthone hydrochloride ("miracil D"), 0.55 g. b.d., for three days over the same period. An E.C.G. taken at the end of the course showed only mild toxic changes. Viable ova of *S. haematobium* were again present in the urine at the beginning of October, and he received a standard course of intramuscular lithium antimony-thiomalate ("anthiomaline") to a total of 40 ml.

He continued to void viable ova, and on October 29 received intramuscular stibophen in the usual dosage to a total of 50 ml. He was still voiding viable schistosoma ova on November 21, and it was decided to embark upon an extended course of treatment with sodium antimony tartrate. He was given three intravenous injections weekly—½ gr. (32 mg.), 1 gr. (65 mg.), 1½ gr. (100 mg.)—and then 2 gr. (130 mg.) thrice weekly.

On December 22 he complained of dimness of vision of the right eye. By this time 21 gr. (1,365 mg.) of sodium antimony tartrate had been given, and from this date no schistosoma ovum has been found in the urine. Visual acuity for the right eye on December 31 was 5/60, the left eye 6/6. Nothing abnormal was seen in the anterior segments, but haemorrhages and exudates were present at the right macula. Both disks appeared normal, as did the left macula. The right fundus was unchanged when examined in the middle of January, 1957, at the beginning of February, and on February 14. A week later, however, some improvement was noted, and on February 25 visual acuity in the right eye was 6/24. The haemorrhages steadily cleared and none was present on March 20, when visual acuity was 6/12 in the right eye. The exudate was lessening in extent and in area, though vision was still 6/12 in the right eye on April 11. On April 29 he said that he was better. It was noted that there were very few retinal exudates and that visual acuity was 6/6 each eye. He continued to have no complaints as regards his eyes, and further examinations at the beginning of June and in September showed no abnormality of the fundi and both eyes to be 6/6.

The patient continues to suffer from attacks of renal colic, but has no other morbid symptoms. Repeated skiagrams of the chest and repeated stool examinations have showed no abnormality, but he has a persistent eosinophilia of 20–23%, with a white cell count of 5,800–8,000.

Case 2

A well-nourished young man of good physique, aged about 23, and weighing 145 lb. (65.8 kg.). He had several attacks of right-sided renal colic, and *S. haematobium* ova were first found in the urine at the beginning of October, 1956. He had no other complaint and routine physical examination revealed no abnormality. He was given lucanthone hydrochloride, 0.6 g. b.d. for three days, receiving five intravenous injections of 14 mg. of sodium antimony tartrate at 12-hourly intervals during the same period. An E.C.G. taken on October 8 at the end of this course showed toxic effects of antimony upon the myocardium.

Viable schistosoma ova were demonstrated in the urine on November 26. A standard course of 40 ml. of lithium antimony-thiomalate intramuscularly was completed by December 23, but again viable ova were seen in the urine.

On January 12, 1957, he complained of dimness of vision of the right eye for the past five days. It was noted that he had "white eyes," and that nothing abnormal could be seen in the anterior segment or in the fundi. He continued to complain of poor vision in the right eye. On February 2 he was found to have amoebiasis and was admitted for treatment of this, receiving emetine and bismuth iodide, 1½ gr. (100 mg.) daily for 10 days.

When the eyes were examined on February 9, intraocular tension was normal. Again nothing pathological was seen in the anterior segments or in the fundi. Vision for the right eye was 6/12, for the left 6/6. He was given a course of lucanthone hydrochloride 1.3 g. daily for three days, since when no viable ovum of *S. haematobium* has been found in the urine. Visual acuity for the right eye was now reduced to 1/60, the left remaining at 6/6. The pupils were equal in size; the fundus on the right side appeared granular, but the macula was otherwise normal. He said that he was better on March 12, when the visual acuity of the right eye was 2/60. By March 20 it was 6/60, by the 28th 6/24, by April 7 6/18, and by May 29 it was once again 6/6. Frequent examinations subsequently have always resulted in 6/6 for each eye, both fundi being normal.

The patient was admitted to hospital on July 7, 1957, when he said that he had vomited blood. No abnormality was found even after a barium meal, fractional test meal, haemoglobin estimation, and repeated stool examinations, and it was thought that he had been mistaken. At various

times he has had skiagrams taken of the chest, and many stool and blood examinations. The only noteworthy feature of all these is that he has a persistent eosinophilia of 15–23% with a white cell count of 7,000–10,000.

Discussion

In neither case is there any obvious indication that the cause of the condition is to be found in the first four of Duke-Elder's categories; nor had either patient been given isoniazid (Sutton and Beattie, 1955), digitalis (Wagener *et al.*, 1946), barbiturates (Carrillo *et al.*, 1938), streptomycin (Sykowski, 1951), gold (Foster, 1943), chloramphenicol (Wallenstein and Snyder, 1952), or sulphonamides (Mansour, 1945). They had not been exposed to carbon monoxide (Casanovas, 1944), bitten by snakes (Guttmann-Friedmann, 1956), or had a cold permanent wave (Robson and Cameron, 1949); they were not addicted to *Catha edulis* (Baird, 1952), or infested with ascaris. They both smoked cigarettes, but not heavily—fewer than 20 a day. There are two factors common to each history: each patient had received trivalent antimony injections, and both developed neurological symptoms at about the same time, the interval being only a few days. The latter suggests that the cause of the illness may have been infective and not related to the antimony.

Summary

Two cases of optic neuropathy associated with visual disturbances and indefinite fundus changes are described as occurring during or following a course of injections with trivalent antimony compounds. The association has not been previously reported.

The patients developed symptoms within a few days of each other, and an infective basis cannot be excluded.

I am grateful to the Kuwait Oil Company for permission to publish; to Dr. K. P. S. Menon, formerly medical officer, Kuwait Oil Company—whose ophthalmic notes I have freely used; and to Sir Stewart Duke-Elder and Dr. J. Guthrie, the chief medical officer of the Kuwait Oil Company, for help and advice.

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The new Biochemical Laboratory which is being built in the Royal Infirmary, Edinburgh, at a cost of £56,000 is designed to do more than accommodate the routine analytical work of the hospital, important though that is. (At present this involves some 80,000 quantitative analyses a year and the work is growing both in volume and complexity.) Facilities will also be provided for work as the reference laboratory of the South-East (Scotland) Region and for research. This last, important in any teaching hospital, is doubly important here, since the laboratory also acts as the University Department of Clinical Chemistry. The new building will release the present laboratories, which are now far too small for their purpose, to give urgently needed space to, for example, the Departments of Therapeutics and Cardiology. The plan is the work of Mr. A. A. Dixon, A.R.I.B.A., the Royal Infirmary architect. It gives routine laboratory space for 20 analysts, a range of special-purpose rooms for chromatography, electrophoresis, fluorometry, etc., eight or nine research rooms, and the accompanying offices, store-rooms, workshop, library, and reading rooms. It is hoped that the building will be completed before the next International Congress of Clinical Chemistry, which is to be held in Edinburgh in August, 1960.

SERUM CONTAINING THREE Rh AUTOHAEMAGGLUTININS

BY

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The occurrence of auto-antibodies belonging to the ABO system has been known since they were first demonstrated by Dockeray and Sachs (1941), followed by a number of other workers whose papers are summarized by Race and Sanger (1958).

The occurrence of specifically identifiable auto-antibodies belonging to other systems in the sera from cases of haemolytic anaemia was first clearly demonstrated by Weiner, Battey, Cleghorn, Marson, and Meynell (1953), who showed the presence of anti-e both in the serum and adsorbed on the red cells of a patient who was e-positive. Numerous similar cases, likewise summarized by Race and Sanger (1958), have since been found. Each serum has, however, been shown to contain one or at most two auto-antibodies. In the present case three distinct Rh antibodies, each specific for one of the patient's antigens, were found in one serum.

Case Report

The patient, Mr. C, of Bucharest, suffered from chronic lymphatic leukaemia with secondary haemolytic anaemia controlled by cortisone and repeated transfusions. The results described refer to his blood before any transfusions were given.

The patient's cells showed agglutination in the direct anti-human-globulin test, and on treatment with papain or with compatible serum and dextran. It was thus possible to group his cells only by means of saline-agglutinating antibodies or after removal of auto-antibodies by elution. The results were as follows: A_1 CcDee (probably CDe/cde), M, S+, P+, Lu(a−), Le(a−b+), Fy(a−).

The serum was found to contain albumin-agglutinating anti-C+anti-D and incomplete anti-e demonstrable only by means of the anti-human-globulin test or the use of papainized cells. In albumin tests at 37° C. the titres were found to be 16 with CDe/CDe and with Cde/cde cells, and 8 with cDE/cde and cDE/cDE. Cells of genotype cde/cde were not agglutinated in albumin. A strong non-specific cold agglutinin was detectable at 4° C.

The anti-e was first detected by adsorption on to cde/cde cells and elution by the method of Weiner (1957), the eluate being tested against papainized cells. It reacted strongly with cde/cde cells, not so strongly with cDE/cde and not at all with cDE/cDE. When the original serum was tested by means of the indirect anti-human-globulin test, the only Rh genotype giving negative results was the rare cdE/cdE, of which we were fortunately able to obtain an example. Cells of genotype cDE/cDE showed zoning when an anti-globulin titration was done, being negative with the patient's undiluted serum and weakly positive with dilutions from 1/4 to 1/16.

The analysis of the serum, however, depends mainly on direct tests of the whole serum against cells of a variety of genotypes: there was sufficient serum only for a few absorption tests and for the one elution test already mentioned. A pure anti-C was prepared by absorption with cDE/cde cells, but absorption with Cde/cde removed most of the anti-D as well as the anti-C. Absorption with CDe/cDE removed all antibodies, showing anti-f to be absent, or

present only in such small amounts as to be removed non-specifically by absorption.

The combination of the three antibodies found does not appear to have been described before. It could arise by ordinary immunization only in a person of the rare genotype cdE/cdE. It is, moreover, interesting to note that only donors of this genotype would have been compatible with this patient, who belonged to the commonest of all Rh phenotypes. He had antibodies against three of his own four main Rh antigens.

Summary

The serum of an untransfused patient of Rh phenotype CcDee (probable genotype CDe/cde) suffering from chronic leukaemia and secondary haemolytic anaemia was found to contain the Rh antibodies anti-C, anti-D, and anti-e.

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Medical Memoranda

A Psychological Analysis of the Munchausen Syndrome: Request for Information

Following the research initiated in 1954 into the Munchausen syndrome by Collie and Grygier,[10] we are interested in ascertaining the present whereabouts of the undermentioned patients whom we have investigated and who are well-known examples of the condition.

Using the principles adopted by Asher,[3] we have deliberately altered the patients' names, but those doctors who encounter them will, we hope, have no difficulty in recognizing them from the descriptions and pseudonyms.

Case 1.—A man, now aged 23–25, generally uses the name Austin Capp, but occasionally Chambers, Stephenson, Prince, or Rolls. He is asthenic, fair, about 5 ft. 8 in. (173 cm.) in height and of average intelligence, and generally gives an address in High Wycombe. He is admitted following abdominal pain or symptoms of meningism and has had numerous laparotomies and lumbar punctures, usually discharging himself from hospitals. His abdomen is a mass of scars. He exhibits a mixed abdominal and neurological picture of Munchausen's syndrome.[2] He has mainly been admitted to hospitals in the London area, but his circuit includes those in the rest of England and Scotland. We last encountered him in Aylesbury in June, 1957. His case has been briefly reported by Sanderson[22] and referred to by Chapman.[9]

Case 2.—A woman, now aged 39, generally uses the name Winifred Keats and Winifred or Joyce Blokeman, but more recently Joyce Allcrook, and occasionally Joyce Morris. She is auburn-haired, with a freckled face, 4 ft. 10 in. (147 cm.) in height and extremely obese—17 stone (108 kg.)—and on admission usually gives an address in the neighbourhood of the hospital. She has bilateral opaque nerve fibres and congenital colobomata, and bifrontal burr-holes due to a prefrontal leucotomy in 1952. Her abdomen is a mass of scarring. She is a mixed example of the abdominal and neurological varieties of the syndrome, and is generally admitted complaining of severe abdominal pain or with symptoms suggesting pituitary or hypothalamic disturbance. More recently she has occasionally presented herself as a cardiological problem. She usually discharges herself, and confines her activities to London and the suburbs. We last heard of her in North London in December, 1957. She has previously been reported on four occasions.[6 7 13 20]

Case 3.—An Irishman, now aged 31, generally uses the name Ernest John Mortlake, but occasionally Chars, McCreary, Nylon, Kellogg, and Finch. He has been described as short, beetle-browed, with thick, dark hair, and the appearance of a mental defective, and is often known as "The Baron." He is frequently found having collapsed in a pool of blood near the hospital of his choosing, and may tell onlookers that he is on his way to a monastery. He is an example of the pure haemorrhagic variety of the syndrome and generally presents himself with bleedings from the ears, nose, mouth, and urinary tract, together with renal colic. He is generally thought initially to be suffering from a severe haemorrhagic disorder, and exhibits a remarkable affinity for pethidine. He has two abdominal scars—one in the R.I.F. and the other in the left hypochondrium due to an alleged splenectomy. There are scars of numerous "cut-down" incisions. He has been admitted to hospitals all over the British Isles and perhaps in France. We last heard of him in Hertfordshire in January, 1958. There are many references to him in the literature, including a detailed account by Grant.[1 2 4 5 8 9 11 13 14–19 21 23–25 27]

Case 4.—A man, now aged 40, uses the name Arthur Flitworth. He is good-looking, carefully dressed, a public-school man with a smooth manner. He is superficially plausible and exhibits flagrant pathological lying, usually asserting that he is engaged on important business, and he has enough background knowledge to keep up the pretence. He has facial scarring together with scars of bilateral craniotomy and frontal sinusotomy, the former operation carried out in Canada. He gives a history of a head injury which followed an air crash, gunshot wound, or bomb explosion. His story varies according to the hospital, and he sometimes complains of C.S.F. rhinorrhoea which resulted in his craniotomy. He is an example of the neurological variety of the syndrome and is generally admitted following epistaxes and a succession of epileptic seizures which do not appear to yield to massive sedation. More recently he has been admitted to a few hospitals complaining of pain in the chest and haemoptysis which is thought to be self-induced, and he generally discharges himself after having caused considerable disturbance in the wards. He has been admitted to hospitals and neurosurgical units throughout the country and in Canada, and was last heard of at the Brook Hospital in December, 1957.

Case 5.—A woman, present age 49, generally uses the name Elsie Shackleton and Elsie de Coverley, but also a great many other names, including Joan Summer, Jean Hops, Joan Lark, Joan de Coverley, Joan Malkin, Joan Morris, Elsie Layton, Elsie Jeans, Elsie Jackman, etc. She is Case 3 of Asher's original article[3] and has also been referred to by Wilks.[26] She is 5 ft. 1 in. (155 cm.) tall, weighs 7½ stone (47.6 kg.), has a sallow complexion, and frequently gives a previous history of a number of fictitious operations for stomach trouble performed at the Royal Devon and Exeter Hospital. She is an example of the abdominal variety of the syndrome, and is usually admitted following severe abdominal pain and a history of recent haematemeses. Her abdomen is a mass of scars, but in addition she has mitral stenosis, and more recently has gained admission to hospitals with anginal pain and breathlessness, and is sometimes thought to have had a myocardial infarct. She now has a left Horner's syndrome resulting from a left cervical ganglionectomy that was carried out for cardiac pain in 1955. Most of her admissions have been to hospitals in London and the Home Counties, and her last known appearance was at Lambeth Hospital in September, 1957.

Case 6.—A woman, now aged about 37, and Case 2 of Asher's original article.[3] She uses three names—Elsie Packoma, Margaret Coke, and Elsie Silverborough. Her abdomen is a mass of scars and she is an example of the abdominal type of the syndrome. Her itinerary includes hospitals in the London and Manchester areas, and she would sometimes maintain that her previous operations had been done by a "house-doctor" in Houston, Texas. She was last heard of by us in March, 1951, at St. James's Hospital, Portsmouth.

We have traced over 120 admissions on one of these patients, and the others do not lag far behind. To our knowledge they still continue their peregrinations, and we should like to follow up their histories.

If any of these individuals are at present hospital in-patients or arrive in the surgeries or casualty departments, it would be much appreciated if the hospital concerned could notify us as soon as possible (write, or phone VIGilant 6611). We would then arrange either to visit the patients directly, or, alternatively, they could be admitted to Banstead Hospital.

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Acute Barbitone and Bromide Poisoning with Unusual Features

Severe poisoning with barbiturate usually causes some or all of the following: coma, absent reflexes, depressed respiration (usually with a slow rate of breathing, deep and stertorous or shallow, often with cyanosis and sometimes pulmonary oedema), variable pulse rate, frequently low blood pressure, lowering of body temperature, and dehydration if coma has persisted for some time. The clinical findings are very variable, depending on the type of barbiturate swallowed, the dose in relation to size, duration of poisoning in relation to a previous meal, and the age and previous state of health of the patient. The findings detailed in the following case history were unusual enough to cause difficulty.

CASE REPORT

A male schizophrenic aged 44 had complained of cough for many years. Pulmonary tuberculosis and dust disease had been excluded, but he had a mild chronic bronchitis. During February and again in April, 1956, while in a mental hospital, he was found to have a slight tachycardia (70–86 a minute), labile hypertension 120/80 to 160/100 mm. Hg. respiratory rate 24–28 a minute, and a normal *x*-ray appearance of the chest.

On July 6, 1957, he was put to bed at 11 p.m. after an episode of mental disturbance; at 7 o'clock the next morning he was found unconscious; at 11.30 a.m. his doctor was called and visited him promptly. The patient was then in coma, all reflexes except the conjunctival were absent, the left leg was more flaccid than the right, he was incontinent of urine, the pupils were dilated, the pulse was slow and of fair volume, and he was frothing copiously at the mouth. The doctor wrote: "The whole condition is suggestive of barbiturate poisoning, but I can find no source for this. He has been on a bromide-barbitone sodium mixture, but has not taken excess of this." He was admitted to hospital at 1 p.m., when his condition was found to be essentially unchanged, and in addition it was noted that all reflexes were absent, anaesthesia was complete, the eyes and mouth were dry and foul, the abdomen was silent, the bladder was not palpable, and the skin was dry; axillary temperature was 103° F. (39.4° C.), pulse 86, B.P. 170/110, and respiratory rate 80. Cardiac sounds were remote, and harsh sounds conducted throughout the chest, but there was no pulmonary oedema. The facies was blue-grey in colour.

Much mucus was sucked from the throat and pharynx and oxygen was given by mask. Samples of blood, urine (2 oz. —57 ml.—by catheter), and C.S.F. (clear, under increased pressure) were withdrawn and sent for analysis. As oxygen therapy did little to relieve the cyanosis and the tachypnoea defeated attempts at manual assistance to respiration, it was decided to inject the contents of 1 ampoule (125 mg.) of the soluble sodium salt of bemegride ("megimide sodium") in 5 ml. of saline intravenously. This compound has a dramatic effect in dogs anaesthetized with pentobarbitone sodium and may increase respiratory minute-volume by eight times within one minute of injection, but its effects in man have not so far been reported.

There was an immediate improvement. Coma lessened; a sluggish light reflex appeared in smaller pupils; reaction to firm supraorbital or plantar stimulation returned; he groaned, grimaced, and babbled words after a few minutes; muscle tone improved greatly; and cyanosis lessened. The B.P. was 160/90, pulse 120, and respirations 60. Within 45 minutes these signs of improvement had gone.

Analytical results were as follows. Urine: sp. gr., 1030, acid; albumin-positive; a trace of sugar; no barbiturate, salicylate, or bromide. C.S.F.: clear, no cells, protein 56 mg./100 ml.

In view of the failure to find barbiturate and because of the marked tachypnoea, fever, and hypertension, 1 million units of benzylpenicillin was given, suction repeated, and the patient transferred to the ward for observation. Thereafter his condition deteriorated, and by 8 p.m. he was in deep coma, flaccid, anaesthetic; reflexes were absent. The pulse was 110–65 and respirations 60/90; the chest was full of rales; B.P. was 110/70; he was sweating heavily and had a temperature of 100° F. (37.8° C.). A glucose-saline drip was instituted and bemegride, 0.4 g., and amiphenazole ("daptazole"), 50 mg., were injected in the course of an hour. Reflexes returned within 30 minutes; pulse slowed to 100, but rose after two hours to 120 and fell below 100 only after 48 hours. Blood pressure declined to 90/60, then rose steadily to 120/60 in three hours and 170/110 in two days. The respiratory rate fell to 50 and in three hours to 30; next day it rose to 35, then declined slowly as fever resolved over three days.

After two hours he could sit up with assistance and take fluids by mouth. On July 8 blood examination showed: normal electrolytes and alkali reserve; Hb, 16.6 g./100 ml.; W.B.C., 23,300 (polymorphs 79%); glucose 147 mg./100 ml.; urea, 80 mg./100 ml.; Wassermann and Kahn reactions negative. The first urine specimen was loaded with albumin, had a trace of sugar, and was like pomegranate juice in colour. Unfortunately the pigment was not determined. *X*-ray films of the chest and E.C.G. were normal. The patient improved steadily on penicillin–streptomycin treatment and was transferred to a mental hospital after five days.

COMMENT

In 354 consecutive cases of barbiturate poisoning observed personally, no patient has had a respiratory rate over 35 a minute, a temperature above 100° F. (37.8° C.), or blood pressure above 140/90 mm. Hg. The abnormal findings and apparent absence of urinary barbiturate or bromide delayed the diagnosis. Bemegride sodium was dramatic in its effect but is hardly diagnostic; bemegride treatment was very effective when used. Blood taken at 2 p.m. on July 7 contained 10 mg. of barbitone per 100 ml. and on July 15 18.75 mEq./l. (150 mg. per 100 ml.) of bromide. He admitted to having taken 5 g. (75 gr.) of barbitone sodium and 10 g. (150 gr.) of sodium bromide at midnight on July 6 in 120 ml. (4 fl. oz.) mixture.

I would like to thank Dr. J. Bathgate, Dr. J. T. Hennelly, consultant psychiatrist, Mr. J. Nicholls, and others for information, help, and facilities.

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Reviews

STRESS IN BONES

Stress and Strain in Bones: Their Relation to Fractures and Osteogenesis. By F. Gaynor Evans, Ph.D. (Pp. 245+x; illustrated. 50s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1957.

The subject of stress and strain in bones usually brings to mind the generalization known as "Wolff's law," put forward in 1892, which states that the trabecular architecture and external form of a bone are determined by the mechanical forces to which it is subjected. This was a development of the views expressed previously by Ward,[1] Wyman,[2] and particularly by Meyer[3] and Culmann,[4] on the mechanical interpretation of the orientation of bone trabeculae. Culmann, it will be recalled, was struck by the resemblance between the arrangement of bone trabeculae in the femoral neck and the calculated lines of maximal internal stress in an engineering structure (a Fairbairn crane) of similar form similarly loaded; the precise significance of this resemblance is still not known.

This relationship between structure and function is only one of a number of subjects covered by the present volume, which reviews work in connexion with the measurement of stresses and strains in bones, the production of fractures, the role of mechanical forces in bone architecture, development and repair, and the influence of factors such as diet on the breaking strength of bone in experimental animals. These are all interesting fields where much work still remains to be done.

The author, who is associate professor of anatomy at the Wayne University at Detroit, has written a number of papers with Professor Lissner and Dr. Lebow of the department of engineering mechanics at the same university, and part of the book deals with the application to various parts of the skeleton of the "stresscoat" technique. This method is used for stress-strain analysis of engineering structures, and consists of coating the object to be studied with a strain-sensitive lacquer and studying the distribution of cracks which are produced in the coating by various conditions of loading deformation. The number of cracks in any particular region measures the amount of stretching—the tensile strain—of the underlying material. When applied to the femur, for example, this type of study shows that loading the head of the vertically orientated bone subjects the superior aspect of the neck and the lateral aspect of the shaft to tensile strain while the opposite aspects of the bone are under compressive force. Loading the shaft of the femur perpendicular to its long axis produces tensile strain on the aspect of the bone opposite to the point where load is applied. When loading of the femur is continued to the point of fracture, this is found to occur at the sites where the first cracks appear—that is, where tensile strain is highest. The various types of femoral fractures seen clinically can be duplicated under controlled conditions of loading and orientation of the bone. Vertical loading of the femoral head leads to failure of the superior aspect of the femoral neck, and ultimately transverse fractures develop in this region. Abduction loading of the greater trochanter leads to failure of the inferior aspect of the neck, and this produces a variety of subcapital intertrochanteric and oblique fractures of the femoral neck, the exact type depending on the location of the initial area of failure. The application of similar studies to fractures of other bones, particularly the skull, pelvis, mandible, and vertebral column, is described. In all these situations, as in the femur, tensile stresses and strains appear to be the ones concerned in the production of fractures.

One section of the book deals with the determination of the stress-strain characteristics (tensile, compressive, shearing, torsion, bending, and fatigue strengths) of bone as a material; in contrast to work on intact bones, this necessitates the study of small samples of standardized size using methods employed by engineers in evaluating similar properties of structural materials. With bone these stress-strain characteristics depend very much on the direction in which the forces are applied; compact bone, for instance, resists compression best when this is applied in the direction of the long axis of its fibre systems. Generally speaking, bone is strongest in compression, intermediate in tension, and weakest when subjected to shearing forces.

H. A. SISSONS.

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BLOOD GROUPS

Blood Groups in Man. By R. R. Race, Ph.D.(Cambridge), M.R.C.S.England, F.R.S., and Ruth Sanger, Ph.D.(London), B.Sc.(Sydney). Third edition. (Pp. 377+xix; illustrated. 42s.) Oxford: Blackwell Scientific Publications. 1958.

This excellent book of Race and Sanger's may have become a little more sober in its opinions, but it has certainly not become less enthusiastic. Sera containing unusual antibodies are "glorious" and "magnificent," and knowledge advances rapidly, guided by a series of "brilliant predictions." A person outside the field of blood groups may wonder what all the joy is about, but to the devotee it is quite plain. During the last 15 years the search for new blood groups has been on in earnest. Every year it has attracted an even larger number of followers, and, as the pack swarms across the field, Race and Sanger ride buoyantly ahead with resounding cries of tally-ho!—the acknowledged leaders of an unusually enthusiastic hunt.

This third edition is a little shorter than its predecessor and far better arranged. Thus, the former rather discursive account of the Rh system, which previously occupied three chapters, is now reorganized into one. A previous table, 18 pages long, setting out the possible children from different matings of Rh phenotypes, is now condensed into a single page. A chapter which has gained greatly from revision is the one dealing with the ABO groups. Some rather questionable information has disappeared, and in its place Race and Sanger's own recent observations on suppressor genes receive due prominence. In the chapter on the Lewis groups the theory of Grubb and Ceppellini receives close attention. One important tenet of this theory is that there are allelic genes L and l; L, which causes secretion of Le^a substance in saliva, is dominant, and is not linked to the genes Se and se which determine secretion or non-secretion of the ABH substances. Ceppellini believes that Le^b is a product of the interaction of the secretor gene (Se) and L. The only difference between the observations of Grubb and Ceppellini is the finding (by Grubb) of an occasional subject of genotype ll,Sese (or Sese), whose saliva inhibits Le^b; Ceppellini suggests that this reaction may really be an inhibition of anti-H. This theory goes far towards making sense of a previously bewildering part of the blood-group field.

In referring to the Coombs test the role played by complement is rather briefly treated: recognition of the fact that in the antiglobulin reaction it is sometimes complement rather than the antibody itself which is detected is surely one of the most important recent advances in blood-group serology. Perhaps the absence of a full account of the subject should be regarded not as an accidental omission but rather as a sign that the authors have now decided to limit their book more strictly to the genetical aspects of blood groups. Indeed, this edition is distinguished by a more rigorous discrimination than was apparent in previous editions, so that now there is a much greater feeling of compactness. As in previous editions, everything is expressed in the most lucid and delightful prose. To suggest to anyone engaged in any aspect of blood grouping that he should buy this book is like telling him that he will need a refrigerator or test-tubes.

P. L. MOLLISON.

LIVER CANCER

Cancer Primitif du Foie et des Voies Biliaires. Études Anatomo-pathologiques et Biologiques. By F.-C. Roulet, R. Camain, E. Lebreton, R. Fauvert, L. Hartmann, J. P. Benhamou, L. Orcel, J. Feroldi, E. H. Betz, and Y. Le Gal. (Pp. 245; illustrated. 3,600 fr.) Paris: Masson et Cie. 1958.

The Anatomical Society of Paris was founded in 1826 by Dupuytren and Cruveilhier. The fifth plenary discussion of the society took place at Strasbourg in May, 1956, when primary cancer of the liver and biliary tract was discussed. The main papers presented by leading French-speaking pathologists are now published in this monograph. The founders of the Anatomical Society would surely have admired this continuation of the French pathological tradition. Fred-C. Roulet (Basle) emphasizes the types and gives a general review of the geographical pathology of primary liver-cell cancer. R. Camain (Dakar) concentrates on the disease as he sees it in French West Africa, and stresses that any cause of hepatic necrosis is followed by regeneration and is hence precancerous. Primary malignant disease of the liver has therefore many aetiological factors which are difficult to disentangle. E. Lebreton (Paris) describes the experimental induction of liver cancer in rats by butter-yellow and its modification by choline-deficient diets. Functional changes induced by the cancer and its clinical associations are hardly considered, but R. Fauvert and co-workers (Clichy) note the occasional association of a peripheral polymorphonuclear leucocytosis, raised serum alkaline phosphatase levels, and hypoglycaemia. The morbid anatomical features of carcinoma of the various parts of the biliary tract are carefully described by L. Orcel (Paris), J. Feroldi (Lyons), and E. H. Betz (Liége). Y. Le Gal (Strasbourg) considers hepato-biliary cancer as it affects the pancreas, and as a cause of obstruction of the hepatic vein, portal vein, or inferior vena cava.

This book is well produced and amply illustrated. Each article is followed by a full bibliography, usually with the titles of papers quoted. It follows the lines of classic pathology with careful tabulation of tumour types, sites of origin, and so on. It will therefore prove of particular interest to pathologists, and of less value to clinicians or research workers in the field of experimental cancer. It is a pity that the book is published two years after the papers have been presented.

SHEILA SHERLOCK.

CONTROVERSIAL MEDICINE

Call the Doctor. A Social History of Medical Men. By E. S. Turner. (Pp. 320; illustrated. 21s.) London: Michael Joseph. 1958.

George Bernard Shaw, whose opinions regarding the medical profession were by no means orthodox, affirmed that "every doctor should be controversially educated"—that is to say, well versed in the unaccepted and unacceptable views on health and disease. The volume under review might serve very well as a guide to "controversial medicine." Although, as the author is careful to explain in his introductory chapter, it is not a history of medicine, it may be called a social history of general practice. Famous doctors and their great discoveries are mentioned only in passing, while doctors who spend their lives in laboratories or at office desks give place to the bedside men whose struggles and strivings down the centuries are here faithfully recorded. Mr. Turner has collected his vast material from many sources, and has compressed it into a most fascinating and attractive narrative which contains many useful lessons for doctor and patient alike.

The book is to a large extent a record of controversies between doctors themselves, between doctors and the public, and between doctors and Governments or lesser "authorities." "The two pitched battles over socialized medicine—the first in opposition to Mr. Lloyd George's Bill, the second in opposition to Mr. Aneurin Bevan's—receive a chapter each." Naturally, it is not possible to discuss such argumentative matters with strict objectivity. Nevertheless the author has been content, remaining himself impartial, to set down the bare facts and to leave each reader to form his own judgment.

The earlier chapters deal for the most part with the humbugs, charlatans, and quacks who have been with us throughout history, appearing to reach the climax of their successes in the eighteenth century. The end of that century and the beginning of the next witnessed a controversy regarding the supply of anatomical material—"one of the deepest rifts ever created between the medical profession and the public." The doings of the body-snatchers, and the more criminal deeds of Burke and Hare, are discussed in a chapter entitled "Subjects for Sale," which will appeal to readers who enjoy the macabre. From this stage we pass to another heated argument, set alight by Thomas Wakley, of the *Lancet*, whose wordy duels with Sir Astley Cooper and others are well recorded. Dr. Lydgate, of *Middlemarch*, and Trollope's *Doctor Thorne* are quoted as typical practitioners of this period, while in a later chapter due mention is made of such works as *The Citadel*, *My Brother Jonathan*, and *The Story of San Michele*.

Some reform and reorganization of medical practice was long overdue when the General Medical Council came into being in 1858, exactly a century ago. Chapter XX of this book—"At Last, a Register"—is of peculiar significance at the present time. The difficulties which have confronted the G.M.C. during its first century are mentioned in this and subsequent chapters; they include the ethical problems relating to broadcasting, press publicity, euthanasia, health education, and other matters. Vivisection, osteopathy, and women doctors are added to the long list of controversial topics.

Some of the original sources of information are given in footnotes, although frequently undated. There is an adequate index, and it is not surprising to note that the British Medical Association and *British Medical Journal* are mentioned on twenty-six pages. The illustrations, twenty-three in number, are unusual and well chosen, though some of them might have been more clearly reproduced. This well-written, informative, and attractive volume, so full of controversy and yet so free from bias, may be warmly commended to doctors and to patients.

DOUGLAS GUTHRIE.

Current Therapy, 1958, edited by Howard F. Conn (pp. 827+ xxx; Philadelphia and London, W. B. Saunders Company, 84s.), is the collective work of some 300 experts, and provides information on the most recent methods of treating all the common diseases. The work has appeared annually since 1939. The present volume lists new agents in the treatment of cardiovascular disease, antihypertensive drugs, new anticoagulants, anticholinergics, anticonvulsants, etc.

A Textbook for Midwives, by Margaret F. Myles, is a detailed account of the practical procedures involved in obstetric nursing. Some account of the anatomy and physiology of the female reproductive system and of normal and abnormal pregnancy is included. A separate chapter is devoted to mothercraft. The book is intended to cover the requirements for the C.M.B. examination and to serve as a reference manual for practising midwives. The third edition is now available from E. and S. Livingstone, Ltd., Edinburgh (pp. 711, illustrated; 42s.).

Breathing Exercises (pp. 77, illustrated; Faber and Faber, Ltd.; 8s. 6d.), by Gladys M. Storey, who is in charge of physiotherapy in the Chest Unit of St. Thomas' Hospital, London, is intended for physiotherapists and remedial gymnasts. It gives practical information on normal respiration and on teaching relaxation and breathing exercises, with some special exercises for specific medical conditions and post-operative breathing exercises. Conditions contraindicating such exercises are also mentioned.

The ABC of Acid-Base Chemistry, by Horace W. Davenport (4th edition, 87 pages), is obtainable from Cambridge University Press, price 15s. It is intended to provide students and physicians with a comprehensive and intelligible outline of the elements of physiological and acid-base chemistry.

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ONE HUNDRED YEARS OF THE G.M.C.

Although many would not accept Benedetto Croce's aphorism that "all history is contemporary history" there are few countries where its implications can be so well observed as in Britain, where the strands of tradition are so woven into the fabric of our daily life that they can be disentangled only with the greatest difficulty. The study of our unwritten constitution necessitates historical study, and if, as a profession, we examine our professional organization and constitution, we find it impossible to arrive at a clear understanding of all its elements without examining their historical origins and development. To a physician, who is by definition "a student of natural science," this should appeal as a natural and orderly procedure. The history of the medical profession in Britain is yet to be written, although the most superficial examination of the materials shows that it is a subject worthy of the kind of attention which Sir Lewis Namier has given to parliamentary history or Professor Tawney to economic history. This lack of a scholarly and authoritative history is probably the reason for the errors of omission in the work of social historians who investigate the complex causes of the improvement in the health and welfare of the British people over the past century: too little attention is paid to the transformation which the medical profession underwent during that period.

The term "profession," which originally had a religious connotation, is defined by the *Shorter Oxford Dictionary* as "a vocation in which a professed knowledge of some department of learning or science is used in its application to the affairs of others or in the practice of an art founded upon it." When, in 1711, Joseph Addison wrote in *The Spectator* of "the three great professions of Divinity, Law, and Physick," his contemporaries identified the third with men of the calibre of Mead and Radcliffe, members of a group so small that few outside the restricted circle of eighteenth-century "society" could claim their services. A century and more later the medical care of a rapidly growing industrial and urbanized community was so heavy in its demands that large numbers of unqualified practitioners took a share in it and reckoned themselves members of the same profession as Richard Bright and Thomas Addison. Medical schools and hospitals were not organized to supply qualified men in sufficient numbers; departments of government were not organized to survey the actual and potential needs of the population and plan to meet them; the organs of public opinion, few as they were, were not well informed on medical matters and reflected a general tendency to dismiss professional complaints as attempts to enforce a lucrative monopoly. It was only after decades of struggle, in which the British Medical Association, and its forerunner, the Provincial Medical and Surgical Association, played a leading and decisive part, that the general public and Parliament could be persuaded that there were grounds for action. The Medical Act of 1858, poorly drafted as it was, marks an epoch in the history of the profession. It established the General Medical Council and laid upon it the responsibility for compiling and maintaining the register of qualified practitioners and for supervising and improving the standards of medical education, with the additional duty of compiling and publishing an official *British Pharmacopoeia*. The centenary of the Council's first meeting, which falls on November 23, is a proper occasion for reviewing the history of its activities and for studying its own development as well as the changes which it has brought about in the profession. The articles which we have asked our contributors to write for this centenary number give some account of the success with which it has discharged its responsibilities.

In his historical review of the events which led up to the passing of the Medical Act of 1858 and of what followed from that, Dr. F. N. L. Poynter shows how the powers and duties of the Council have evolved largely in response to the medical profession's own demands. He records that in 1879 W. Rivington complained that "the least satisfactory part of the work of the Council has been given to professional education." Some of the reasons why this should have been so can be found in Professor A. P. Thomson's account of the influence of the G.M.C. on education (p. 1248): "The truth is," he writes, "that ever since its birth in 1858 the General Medical Council has faced a wellnigh insoluble problem"—the hoary old one of fitting a quart into a pint pot. But now that the Council has placed responsibility for experiment and advance on the medical schools Professor Thomson is hopeful that the difficulties caused in the past by the rigidity of the curriculum may be overcome. The most spectacular part of the work of the G.M.C. is the exercise, *coram populo*,

of its disciplinary powers. The public, and perhaps some doctors too, regard the sittings of the Disciplinary Committee as a court of law. Mr. C. P. Harvey examines this conception in an illuminating article (p. 1257), showing how close the resemblances are in some respects and yet how different in others. Much less in the public eye is the Council's work of keeping the *British Pharmacopoeia* up to date. The extent and purpose of this work is outlined at p. 1250 by Professor D. M. Dunlop and Mr. T. C. Denston. Another publication of the G.M.C. is the *Medical Register*, which is the subject of a short historical note (p. 1292). The first *Register*, published in 1859, contained the name of one woman, Dr. Elizabeth Blackwell, who had qualified in New York State ten years before. Dr. Annis Gillie describes the career of this extraordinary woman (p. 1253), whose ability and strength of purpose impressed the leaders of liberal opinion in Great Britain and did so much to open the doors of the medical profession to women.

The establishment of the General Medical Council was much more than a mere administrative reform. It was indeed a revolutionary step which was urged from within the profession and not from without, demanded by the rank and file of the profession and not imposed from above. Some of the earlier representatives on the Council hardly knew what to do with the powers entrusted to them or even exactly what they were. A detailed and faithful description of the medical scene at the time of the Council's first sitting would present so extreme a contrast to the present that it is astonishing that so much could have been achieved in what is, by historical standards, so short a time and by means which seem so simple. There was the minimum of compulsion. The medical practitioner was to be trained sufficiently to obtain a regular qualification, and then, if he wished to practise, to register his qualification and thereafter to conduct himself according to the ethical and moral standards current among his professional colleagues. A great deal was achieved by consultation and discussion, both private and public, and by persuasion and example. Existing authorities were not swept away, but brought in to take their due part in hammering out a common policy so that age-old antagonisms and fears were gradually forgotten and new legislation, as it became necessary, merely set the seal on agreements already arrived at. Once the struggle for "direct representation" on the Council was won the profession and the public could be confident that the Council was truly representative of the whole profession. When the Council issued recommendations it was felt that the moral force of a united profession was behind them. Without this agreement and this unity the Council could easily have become fixed in a rigid mould as a mere regulating organ on behalf of the State. As it is, it has become the exponent of educational and ethical ideals which are eventually established as current standards—and that is the measure of its success.

BRITISH MEDICINE OVERSEAS

The debate at this year's A.R.M. in Birmingham on the possibility of filling retirement vacancies in the consultant grade of the N.H.S. some time before they occur[1] had a sequel last week in London. A well-attended conference, convened by the B.M.A. and under the chairmanship of the President, Professor A. P. Thomson, discussed the filling of medical appointments overseas, and Professor Charles Wells made out a strong case for filling hospital appointments in the N.H.S. ahead of the vacancy occurring, arguing that this would create a group of "consultants-designate" who could be encouraged to take service abroad during the period that would elapse before they assumed their appointments in the N.H.S. As can be seen from the report of the conference published in this week's *Supplement*, Professor Wells's suggestion was only one of several made to overcome, at least partially, the difficulties of those who hope to find in Britain suitable men and women to fill medical vacancies overseas and of those who might be inclined to apply for them. The latter are likely to be deterred by two main risks—the possibility that their careers may be cut short when an overseas territory becomes self-governing and the difficulty of finding employment in the N.H.S. when they return, perhaps with only a small pension, to Britain. These are risks faced by those who might be prepared to spend a major part of their professional life abroad, and the conference was unable to do much more than define them and point to possible reasons for not over-emphasizing their gravity. Dr. E. Grey-Turner thought something could be done by finding employment in the medical branch of the Home Civil Service for those returning from overseas service. Comparatively few speakers mentioned the importance of the financial inducement in attracting people to work overseas, but plainly the vacancies will be all harder to fill if salaries at home are better than those abroad. The fact that doctors in a service overseas feel that they are debarred from applying for posts in the N.H.S. or in universities in Britain is bad for morale, and Professor K. R. Hill's suggestions for overcoming this were generally welcomed.

The conference heard several interesting proposals

[1] *Brit. med. J. Suppl.*, 1958, **2**, 68. See also annotation in *Brit. med J.*, 1958, **2**, 604.

for dealing with the problems of the short-term appointment. Professor A. Moncrieff urged the forging of a link between the Overseas Civil Service and the N.H.S., and described the advantages of filling certain vacancies by the secondment of registrars from Britain. Professor Wells's plan for proleptic appointments has already been mentioned, and Professor K. R. Hill advocated the creation of supernumerary appointments on the staffs of universities and hospitals in the United Kingdom, the holders of these appointments to be seconded to vacancies overseas. These proposals all have much in common, and though they can be objected to on points of detail it would not seem to be beyond the bounds of practicability to put one or more of them to trial. The essential safeguard for the young doctor prepared to work a year or two overseas is a secure foothold on the ladder of promotion in the N.H.S. on his return to Britain. Professor J. H. F. Brotherston made the point that once it became known that a senior registrar improved his chances of obtaining a consultant appointment by working for a time abroad, then university and hospital authorities overseas would have no shortage of candidates for vacancies.

Though the conference may not have come to any definite conclusions, the seriousness of its purpose was very evident. British medicine in the past has built up a great tradition abroad, and there is a fund of good will towards British doctors which in the present state of the world it would be folly not to keep replenished. Professor K. R. Hill voiced the feelings of many at the conference when he said that the extension of British culture still had an important part to play in shaping the world's destiny.

OPERATIONS FOR FALLOT'S TETRALOGY

The surgical treatment of Fallot's tetralogy is moving into the stage of complete correction and cure of the condition owing to the successful development of heart–lung by-pass techniques.[1] However, the operative mortality is still forbiddingly high in all except a few centres. Consequently the paper by Dr. Maurice Campbell in the *Journal* last week (p. 1175) reporting the long-term follow-up of a large series of cases under his care and mostly operated on by Sir Russell Brock is of great interest in showing what results may be expected from the earlier operations under the best conditions. This paper compares the results of treatment of Fallot's tetralogy (the commonest form of morbus caeruleus) by means of, first, the Blalock–Taussig subclavian–pulmonary-artery anastomotic operation (165 cases) and, secondly, the Brock direct operation of pulmonary valvotomy or infundibular resection or both (111 cases). It provides the largest series published in Great Britain and can be assessed alongside the American series of W. J. Potts and colleagues[2] and B. D. White and colleagues.[3]

The anastomotic and direct operations have had a similar and immediate good result in approximately 70% of all those patients coming to operation, and it is against the results of them that the newer operations will have to be assessed. The results of the anastomotic operation have been followed up for an average of 7½ years, and of the 130 originally classified as good post-operatively 80% have remained in this group, while 6% have died and 14% have lost much or all of their improvement. The direct operations have an 89% good post-operative result. These patients, of course, still have the tetralogy after operation, and the late deaths are due to cerebral complications in one-third, cardiac failure due to the increased pulmonary flow in another third, and unrelated causes in the remainder. The causes of regression were increasing stenosis with time, while closure of the anastomosis occurred in some cases with loss of the continuous murmur. On balance Campbell considered the late results of the direct operation to be better than those of the anastomotic in spite of a slightly higher operative mortality, which was declining in the later cases. In both operations a 10% increase in size of the heart is expected and acceptable as an indication of reasonable pulmonary flow. When the very poor expectation of life of untreated patients is compared with Campbell's estimate that 50% of the successfully treated cases will still have a good result 20 years after the operation, it is apparent what a great improvement the introduction of these two operations was.

Relief of the obstruction to the outflow tract of the right ventricle is the main principle of the direct operation, and this holds good for the curative operation on heart–lung by-pass. Closure of the ventricular septal defect and correction of the overriding aorta are added to the latter operation ; once the ventricular septal defect is closed, the formation of an adequate outflow tract is paramount.

In the by-pass operation there are three alternative procedures. First, if the outflow tract is still insufficient after closure of the ventricular defect, the surgeon inserts a patch or gusset of plastic material into the wall of the right ventricle and in some cases extending up into the pulmonary artery across the valve, thus increasing the size of the outflow tract until no

[1] Warden, H. E., de Wall, R. A., Cohen, M., Varco, R. L., and Lillehei, C. W., *J. thorac. Surg.*, 1957, **33**, 21.
[2] Potts, W. J., Gibson, S., Berman, E., White, H., and Miller, R. A., *J. Amer. med. Ass.*, 1955, **159**, 95.
[3] White, B. D., McNamara, D. G., Bauersfeld, S. R., and Taussig, H. B., *Circulation*, 1956, **14**, 512.

gradient exists from ventricle to pulmonary artery. The second is for the surgeon to core out as much as possible of the infundibular region and split the valve if necessary, accepting any residual pressure gradient that may be left in the hope that it will regress with time. The third method, as suggested by Brock among others, is to do a preliminary valvotomy or infundibular resection, wait a few years for the outflow tract and pulmonary artery to develop, and then close the ventricular septal defect at a later stage. The first procedure, carried out with prosthetic materials, is giving good results in centres like the Mayo Clinic, but long-term data on the fate of these foreign bodies are not yet available. The third method may be the best in infants or when there is extreme hypoplasia of the pulmonary artery, but adds the hazard of a second exposure of the ventricle in the presence of anticoagulants and multiple vascular adhesions.

The two main complications of heart–lung by-pass for Fallot's tetralogy are, first, heart-block, which with the development of effective artificial pacemakers is now much less of a problem, and, secondly, sudden death in the first few days after operation. Though various theories have been put forward to explain this mortality, none are satisfactory, but the danger seems to decline with increasing practice in this difficult technique. In conclusion it is worth remembering that, in spite of its present and it is hoped temporary higher mortality, the complete correction by the heart–lung by-pass operation should lead to normal health, with none of the late complications mentioned by Campbell as following the anastomotic and direct operations. While the extracorporeal method thus represents the ideal, the decision on which operation should be performed may vary with the facilities available and the clinical state of the patient.

RENAL RESPONSE TO EXERCISE

Severe exercise is believed to have three principal effects upon the kidney—transient proteinuria,[1] diminution of urine flow,[2] and a fall in the renal blood flow[3] which results from renal arteriolar constriction and the diversion of blood from the kidney into the active muscles. As long ago as 1910 J. H. Barach[4] observed casts and red blood cells in the urine of marathon runners, and during the last four years reports have appeared confirming this finding after other forms of severe exercise.[5 6 7] American football and boxing were the first sports to be investigated, and it was supposed that direct trauma to the kidneys by blows or jostling was the cause of the urinary abnormality. Recently E. P. Alyea and H. H. Parish[8] have thrown doubt upon this explanation. They compared the urinary findings after rowing and swimming—sports which they regard as being non-traumatic to the kidneys—with those after running, lacrosse, football, and boxing. The athletes were all taking part in intercollegiate matches entailing all-out effort. Whatever the sport, 55 to 80% of the athletes afterwards passed urine which contained more than a "trace" of protein, together with at least three red cells and three casts per high-power field. The actual numbers of red cells passed were greater in the "contact" sports of boxing, lacrosse, and football. In any one sport the severity of the urinary abnormality was directly proportional to the duration of effort. This was well shown after the track events: the short sprints caused no abnormality, but three out of six quarter-milers had six to ten red cells per field, and so had both the two-milers. One of the latter had proteinuria, graded as ++++, with more than 20 casts per field. Alyea and Parish suggest that the urinary abnormalities appear in response to exercise and that direct renal trauma plays but a minor part. It should be noted that the urinary changes do not occur during exercise but only afterwards. Information about their duration is less precise. The urine usually returns to normal in 24 hours,[8] but Barach noted the persistence of urinary protein and casts in 3 of 19 marathon runners as long as three weeks after the race.

Little is known of the mechanism which brings about these urinary changes. Adrenaline, the nervous state of the individual, and direct renal trauma do not appear to be of great importance.[8] The presence of a circulating nephrotoxin has not been considered. Chief interest has centred around the possibility that renal ischaemia may be responsible. The renal blood flow during severe exercise may fall to as little as 25% of the resting normal level,[9] but it is doubtful whether the extent of its fall during all-out athletic endeavour is accurately known. A further fall below 25% would certainly bring the renal flow into the range (10 to 20% of normal) which is known to be associated with ischaemic damage to the nephron in traumatic shock. But, even if ischaemia is the primary event, the changes that it induces in the kidneys remain obscure. The occurrence of abnormal findings after, rather than during, exercise suggests a selective vasoconstriction causing damage and loss of filtration in some nephrons but not in others. When constriction ends, filtration in these nephrons is resumed, but there is now a loss of protein, red cells, and casts. The chief difficulty about this hypothesis is to envisage a lesion which is severe enough to cause haematuria but which can heal within 24 hours: the tubulo-venous anastomoses[10] and the capillary haemorrhages into tubules[11] which have been described in acute renal failure would seem to be too gross. Transient glomerular damage might be a more plausible explanation.

[1] Collier, W., *Brit. med. J.*, 1907, **1**, 4.
[2] MacKeith, N. W., *et al.*, *Proc. roy. Soc. B.*, 1923, **95**, 413.
[3] Barclay, J. A., *et al.*, *Amer. J. Physiol.*, 1947, **148**, 327.
[4] Barach, J. H., *Arch. intern. Med.*, 1910, **5**, 382.
[5] Gardner, K. D., *J. Amer. med. Ass.*, 1956, **161**, 1613.
[6] Amelar, R. D., and Solomon, C., *J. Urol.* (*Baltimore*), 1954, **72**, 145.
[7] Boone, A., Haltiwanger, E., and Chambers, R. L., *J. Amer. med. Ass.*, 1955, **158**, 1516.
[8] Alyea, E. P., and Parish, H. H., ibid., 1958, **167**, 807.
[9] White, H. L., and Rolf, D., *Amer. J. Physiol.*, 1948, **152**, 505.
[10] Dunn, J. S., Gillespie, M., and Niven, J. S. F., *Lancet*, 1941, **2**, 549.
[11] Taylor, W. H., and Reid, J. V. O., *J. clin. Path.*, 1956, **9**, 184.

In our present state of knowledge it is hard to believe that haematuria during exercise arises from lesions that are wholly benign and that repeated insults of this sort will not, in some individuals, have a cumulative effect upon the kidneys. Alyea and Parish argue therefore that exercise should be limited in patients with parenchymal renal disease. On the other hand, there is no evidence that athletes tend to suffer from chronic renal disease in later life. An investigation of renal function in athletes, followed up for many years, would certainly seem desirable. Modern training schedules and the continuing improvement in athletic standards may have increased the need for this. The renal blood flow normally comprises one-quarter of the resting cardiac output and is the greatest single source from which blood can be diverted into active muscles. The lower the blood flow that an athlete can, by training, persuade his kidneys to accept, the better his performance is likely to be. It may be that athletes are coming uncomfortably close to accepting transient renal hypoxia as the price of athletic achievement.

BUMPS IN THE NIGHT

Asked at a meeting last week what could be done to reduce the noise in hospital wards at night, the chairman of the medical committee of the Torquay hospitals said, "It is rather like asking how to make a railway station quiet."[1] The recent annual report[2] of the King Edward Hospital Fund for London had something to say about this problem, and now the Fund has published a useful booklet[3] on the control of noise in hospitals. The recommendations are based on the results of an inquiry carried out at 15 hospitals, all but four of which were in London. At first an attempt was made to measure in decibels the intensity of the noises heard in hospital wards, but this method failed to provide the information wanted. A completely different approach was more rewarding: patients were asked to say which noises chiefly worried them, and then action was taken so far as possible to prevent those noises being made.

In hospital wards at night the nuisance value of a sound may bear little relation to its intensity. Even a mild-tempered person in the best of health can be goaded to murderous thoughts by the tapping of hard-heeled shoes on uncarpeted floors in the small hours of the night, so it is no wonder the report records that this noise or the rattle of a bunch of keys in a cupboard door "often causes irritation to a sleepless patient who is recovering from illness or operation." An appendix to the report gives some excellent practical suggestions on how to prevent many of the noises most commonly complained of (though the cure of snoring has yet to be found). By careful maintenance of equipment and small adjustments to doors, ward screens, and trolleys some hospitals have already greatly reduced the noises which wake patients or keep them awake. Washing-up in stainless steel sinks can be made less resonant by painting the undersurface of the sink with liquid rubber, and a polythene basin inside the sink reduces the clatter of crockery. Rubber dustbins are now in use in many hospitals, and polythene trays, bowls, and dishes can replace those made of metal. Not surprisingly, call systems and telephone bells came in for criticism by patients. Florence Nightingale wrote that "unnecessary noise is the most cruel absence of care which can be inflicted on sick or well," and hospitals which fail to take the lessons of the King's Fund report to heart may rightly be accused of lack of care.

[1] *Western Morning News*, November 14.
[2] See *Brit. med. J.*, 1958, **2**, 298.
[3] *Noise Control in Hospitals*, 1958, King Edward's Hospital Fund for London, 14, King Street, London, E.C.2. Price 1s.

THE NATION'S HEALTH

A possible clue to the present typhoid outbreak suspected of being caused by infected oysters from West Mersea[1] comes in the latest Annual Report of the Chief Medical Officer of the Ministry of Health.[2] He briefly describes some cases of typhoid reported to have been infected, over the years since 1949, with an unusual strain of *Salmonella typhi*. This strain, designated "West Mersea," was found at various times in cockles and oysters obtained at West Mersea, and in the sewage system there. The organism causing the present outbreak appears to have similar characteristics to those in previous West Mersea outbreaks, but the source of it has not yet been traced. Evidently there may be a considerable number of carriers about, and the public health authorities are making the usual investigations. Though typhoid is not a common disease in Britain, owing to the vigilance of the public health services, it is a serious one, and the present small outbreak prompts the question, How thorough is the control of oysters between their harvesting and their marketing? Are the best measures being taken to ensure the bacteriological cleanliness of oysters gathered from the various beds round the British coasts?

Several other outbreaks of disease caused concern. The epidemic of Asian influenza began in 1957; four cases of smallpox, two resulting in death, were reported after three years without the disease; a case of indigenous malaria was detected at Warrington, also after three clear years; and of five cases of tetanus in a hospital at Stoke-on-Trent two were fatal.

Another infectious disease stated to be causing trouble is gonorrhoea. The C.M.O. reports a steady rise in the number of new cases attending the clinics, and says "it is now apparent that penicillin, effective though it has been, cannot by itself make a lasting impression on the incidence of this disease." There is said to be a misplaced faith in "one-shot" treatment, with consequent reluctance to attend for follow-up. Moreover, in some districts "strains of gonococci more or less resistant to penicillin are in circulation," thus apparently upsetting the old belief that resistant strains were not developing. A "startling rise" in the number of teenage prostitutes committed to Holloway Prison is reported, over 50% of them infected and many of them ignorant of the dangers of venereal disease. If gonorrhoea continues to increase, syphilis is likely to do so too, and the C.M.O. emphasizes that "this is no time to

[1] *Brit. med. J.*, 1958, **2**, 1239.
[2] *Report of the Ministry of Health for the Year 1957*. Part 2. H.M.S.O., 1958.

think of lowering our guard against these largely preventable infections."

The incidence of lung cancer continues to rise, and so, despite a widespread if imprecise knowledge of the consequences, does the smoking of cigarettes. The deaths from this disease, and perhaps those from motor-car accidents, pose the two great public health problems of to-day. The fact that no experimental proof of an invariable connexion between tobacco smoking and cancer has been provided, comparable to the experimental proofs of how certain germs cause specific diseases, leaves those who are so minded to say that the connexion is only statistical. But, as the C.M.O. states: "Though a few have denied the completeness of the data compiled in the several studies of Doll and Hill and although the statistical validity of their conclusions has at times been challenged it has survived all attacks Confirmation in plenty has come from many reliable sources. The Medical Research Council has stated that the most reasonable explanation of the sum of evidence on this subject is one of cause and effect." It is in any case a commonplace in industry to take preventive action on just such statistical evidence.

Finally, with a crude death rate of 11.5 per 1,000 population in 1957, England and Wales had "about as low a figure as one can expect" in a population of that sex and age pattern, and the natural increase of births over deaths (208,511) was the highest since 1949.

GRADING ATHEROMA

We do not know what causes atheroma, but at least we can measure it post mortem and obtain an estimate of its incidence in various parts of the world. Observer A says there is no atheroma in a certain population; observer B says the prevalence is the same as everywhere else. Dietary habits among other things are excused or incriminated accordingly.

Last year a study group of the World Health Organization consisting of fifteen distinguished experts, including Professor J. B. Duguid, of Durham, met in Washington to formulate recommendations on how atheroma may be uniformly examined and recorded. Their report[1] is both interesting and constructive. It seems that British schools are at last losing the battle to retain the term "atheroma" in favour of the transatlantic "atherosclerosis"—which at least one of our professors has ridiculed as meaning "porridgy hardness." Atheroma is now degraded to one of the sub-groups of atherosclerosis; the others are fatty streaks or spots, fibrous plaques, and lesions complicated by ulceration, haemorrhage, thrombosis, and calcification. The report says that below the age of 30 fatty streaks and spots are best demonstrated by fat stains on the gross specimen. It suggests that the surface area affected by various types of lesion might be expressed as a rough index and that the pathologist should pay special attention to the aorta, and coronary and cerebral arteries, while noting any lesions in pulmonary, renal, and mesenteric arteries. Specimens of aortas can be nicely preserved flattened out in plastic bags containing a little formalin in an ingenious press made of two hinged boards faced with foam rubber.

Not everyone would agree about the best routine for examining the heart at necropsy. An excellent way is to slice off the apical third of the heart first, then to open the coronary arteries in continuity and lengthwise very cautiously with scissors, starting at the ostia. In this way a recent clot can be seen undisturbed, and, if onward progress is halted, transection can be tried or the vessels approached from the cut surface. After this, chambers and valves can be examined before slicing the ventricles completely from apex to base. Histological changes to be found in the atheromatous aorta are listed, and these could be studied in selected cases. With coronary arteries, narrowing and intimal haemorrhages are obviously most important. The study group describes in detail the various accessory aids to grading such as measurement of elasticity, consistency and viscosity, radiography, "cool-dry" methods of rendering the intima translucent in the whole specimen, measuring surface unevenness, scanning techniques for measuring the extent of stained lesions, fixation of vessels at the blood pressure and temperature of life, and other special methods.

The most difficult part is going to be the co-ordination of studies. The scheme proposes enlisting the aid of hospitals, laboratories, and institutes, with national and regional centres; in addition, an international pathology group and centre, and at the top, as it were, a W.H.O. advisory panel. The international centre will have the task of collecting material and distributing study sets to lesser centres, which will then keep pathologists who do the work well informed. Data on environment or other related problems would be valuable, and small special study groups might investigate problems like the influence of diet and drugs on atheroma. In recording details of the patients, the "ethnic origin" is specified; according to the *O.E.D.*, Christians and Jews will thus be excluded. Perhaps the simple word "race" might be better. The recommendations of the group are comprehensive, but to fulfil them might require specially trained staff attached to all co-operating mortuaries. The group is therefore wise to suggest starting in a small way.

[1] "Classification of Atherosclerotic Lesions," *Wld Hlth Org. techn. Rep. Ser.*, No. 143, 1958.

THE SECRETARY OF THE B.M.A.

Dr. D. P. Stevenson began his term of office as Secretary of the B.M.A. last week, his appointment as successor to Dr. Angus Macrae having been made in May this year.[1] Dr. Stevenson assumes office at a time of some unrest and anxiety in the profession. The report of the Royal Commission on Doctors' and Dentists' Remuneration is expected in the summer of 1959. The Porritt Committee on review of the N.H.S. starts work next week. The new Secretary of the B.M.A. will have the encouragement and support of its members in meeting these heavy demands on his administrative skill and organizing ability. And they will extend their good wishes to Dr. Angus Macrae in the less arduous post he has been fortunate enough to obtain in his retirement.

[1] *Brit. med. J.*, 1958, **1**, 1171.

Drug Treatment of Disease

TREATMENT OF CHRONIC HEART FAILURE

BY

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When the heart first shows signs of failure the right side or the left side generally fails first, but these problems of acute heart failure are to be discussed in a later article. In chronic heart failure both sides are affected, and there is the general picture of congestive heart failure with a rise of venous pressure, oedema of the ankles and a sacral pad, enlargement of the liver, and congestion of the lungs. Sometimes, however, signs of left ventricular failure may still form an important part of the picture.

Occasionally, failure that appears to be chronic is due to a cause that can be remedied, such as thyrotoxicosis, a large patent ductus, or some cases of mitral stenosis. Such causes should be looked for and the patients should be relieved of their failure so far as possible and then cured of its underlying cause.

General Principles

In chronic heart failure limitation of exertion to an amount compatible with the state of the patient's heart must be the first consideration. Some patients with adequate treatment can be kept at work with minimal signs of failure, and this is obviously the ideal. Others, in spite of every form of help, can only do a little in the house or are almost confined to bed. In the more favourable cases, it is important to find what the patient's capacity is and to keep him within these limits.

Digitalis and Aminophylline

Some form of digitalis is still a most important part of treatment. There are many forms and the doctor should use one or two of which he has experience and should not change them frequently. Mackenzie almost confined himself to tincture of digitalis, for he said that his life had not been long enough to learn all he wanted to know about it; and, with the increasing number of drugs of all types available, this has become even more important.

Tincture of digitalis, 15 minims (0.9 ml.) three times a day, tab. digitalis fol., 1 gr. (65 mg.) three times a day, or digoxin 0.25 mg. three times a day, are well-proved remedies that can be relied upon to produce good effects, and the amounts mentioned should be adequate and not too much in most patients, though the right dose has to be learned for each one individually. Unlike most drugs, the largest amount of digitalis that can be taken without toxic symptoms generally produces the best results, and most patients getting about will be better with a little more than they needed when resting in hospital.

In heart failure with normal rhythm, as in many cases of hypertension, less good results can be expected from digitalis than, for example, in cases of mitral stenosis and auricular fibrillation. It should be used in these cases and I think in the same amount, but some of my colleagues think more cautiously and in smaller amounts, as there is some risk of inducing auricular fibrillation. If a patient is on the correct amount of digitalis, it can be taken for years, but he should be familiar with the signs of overdosage—nausea, vomiting, and a slow pulse. If this occurs, all digitalis should be stopped for 48–72 hours, and then resumed at a rather lower level.

Aminophylline has its main use in the treatment of acute left-sided failure, but by lowering the venous pressure and stimulating respiration it may prove beneficial in chronic failure as well, especially if there is paroxysmal nocturnal dyspnoea or Cheyne–Stokes breathing. It is far more effective intravenously, 250 mg., but can be given by mouth, 100 mg. three times a day or more if a patient can tolerate it without nausea. If paroxysmal dyspnoea is troublesome at night, a suppository containing aminophylline may help.

Diuretics

The doctor's task may be made easier, and stricter treatment postponed, if, as is discussed later, salt is reduced in the cooking and taken sparingly or not at all with meals, and if the fluid intake is limited to 30 or at the most 40 oz. (0.9–1.1 litres) daily. If, at a later stage, stricter limitation of sodium is needed, fluid need not be so limited.

An important advance was made when mercurial diuretics were introduced, and this was bettered when theophylline was combined with the organic mercurials, as in mersalyl ("salyrgan"), "neptal," and "esidrone." These diuretics act on the renal tubules by preventing the reabsorption of sodium, and so the urinary output is increased. After a test dose of 1 ml. the usual dose is 2 ml. intramuscularly, and this contains 80 mg. of metallic mercury and 100 mg. of theophylline. After the first few days it is rarely wanted more than twice a week. Many patients get adequate diuresis with these injections once or at the most twice a week, or may need them only from time to time. When they are in regular use, the daily urinary output should be checked to see if the weekly output is any higher when the diuretic is given twice a week than when it is given once a week.

Mercurial diuretics are generally more effective if ammonium chloride is given just before them. At first, when 30 gr. (2 g.) was given three times a day for one or two days before the injection, the patient was often upset by it, and now as a routine less is given and sometimes it is omitted. It does, however, generally add to the diuretic effect, and 30 gr. (2 g.) given once two hours before the injection, or twice two and four hours before, is advisable unless diuresis is adequate without it.

Mercaptomerin ("thiomerin"), a combination of the organic mercurial with a mercaptide group, has much the same effect. Attempts have been made for a long time to produce an effective oral diuretic of this group, but not very successfully. Chlormerodrin ("mercloran") was used a good deal, but generally it failed to produce a good diuresis regularly when given in amounts that the patient could tolerate. Some newer diuretics will be discussed later. Mersalyl has been proved reliable over years of experience. Though a few patients reach a stage where it ceases to be effective, often because the balance of the electrolytes is upset, this need not be expected, and, provided there is no serious renal disease, it can often be taken for years with great benefit.

Apart from the mercurial diuretics which act by preventing the reabsorption of sodium in the renal tubules, there is another group that act by inhibiting the enzyme carbonic anhydrase. Normally, this helps the reaction in the distal tubules when sodium alkaline phosphate and carbonic acid are changed to acid phosphate and sodium bicarbonate;

the latter is reabsorbed and so half the sodium is saved. If this is inhibited more sodium is excreted.

Acetazolamide ("diamox"), a sulphonamide derivative, is sometimes a useful oral diuretic, but one cannot rely on it being effective in all patients. The usual dosage is 250–400 mg. daily. It causes a metabolic acidosis from which it takes about three days to recover, so it should not be given at intervals shorter than this. Braveman *et al.* (1957) found that when all treatment was kept the same except that 250 mg. of diamox daily by mouth was substituted for mercurial diuretics intramuscularly the result was satisfactory for long periods in most of the patients. If all diuretics were stopped the patients gained weight owing to oedema, but improved again when diamox was resumed. Side-effects were not observed. Most workers, however, have found that diamox is not always as effective as this.

Aminometradine ("mictine") is another helpful oral diuretic, but, again, effective only in some patients and sometimes only for a time. It is best given for two or three consecutive days each week, 3 or 4 tablets of 200 mg. daily. It is apt to cause nausea and vomiting.

Amisometradine ("rolicton") seemed to Jose and Wood (1958) after most carefully controlled observations a better diuretic and one less apt to cause vomiting. In most of their patients, 400 mg. was given three times a day for two days consecutively and alternately with mersalyl. The increased output lasted over 48 hours rather than the 24 hours after mersalyl, and was sometimes greater on the second and third days after than the first and the second. They concluded that this amount had rather less than half the diuretic strength of a single injection of 2 ml. of mersalyl. They did not observe any toxic results, though nausea and rarely skin reactions, and once leucopenia, have been reported. It produces an equal excretion of sodium and chloride and some increased potassium loss. In some other patients the same amount given continuously for ten days produced a good diuretic response without any side-effects.

Urea was used as a diuretic a long time ago, but recent reports have drawn attention to its value in patients who are proving resistant. Papp and Shirley Smith (1957) have tested it carefully on patients with chronic heart failure, in several of whom mercurial diuretics had become ineffective. They gave 15 g. of urea dissolved in 60 ml. of water three times a day, and most patients could take this without anorexia and vomiting. Those who found the sickly taste intolerable were able to take it dissolved in grapefruit juice. These physicians found great improvement in more than half of 17 patients, and in a few it had been effective for years and had enabled them to resume some quiet activity.

Chlorothiazide ("saluric"), an aromatic sulphonamide derivative, has been introduced more recently and promises to be a most effective oral diuretic. Like the mercurial diuretics, it acts mainly by inhibition of tubular reabsorption, but adds to its effect by inhibiting carbonic anhydrase. At first, 0.5 g. should be given four times a day for three or four days, and this amount may prove enough. It leads to a loss of potassium, and, if it is given in full doses for long, potassium 2–5 g. should be given daily. It has not perhaps been used long enough to find out its drawbacks, but it appears to be a most effective oral diuretic and can sometimes be tried in place of the mercurial diuretics intramuscularly.

Sodium Restriction

Limitation of salt has been mentioned as a treatment that helps without causing trouble or discomfort to the patient. Strict limitation of the sodium intake to 500 mg. is exceedingly effective and may enable the doctor to control congestive heart failure in a way that would otherwise be impossible. It should not be used as a routine at the start so long as simpler methods of treatment prove effective, because it is always a trouble and often a serious inconvenience to the patient and may make his food unattractive to him. When it is necessary, this strict limitation of sodium can generally be carried out better and more intelligently by the patient if he has been taught in hospital by the dietitian how to do this. It can, however, be started without this, and there are many detailed instructions available (e.g., Wood, 1956). Shortly, the principles are that no salt should be taken at meals and no salt or baking powder used in the cooking, and that the patient must learn about the foods that contain sodium. Most meats can be taken, but not bacon, ham, sausages, salted beef, duck, grouse, meat paste, or tinned meats. All fish can be taken except kippers, bloaters, smoked haddock, smoked salmon, lobster, crab, shell-fish, tinned fish, and fish paste. Most vegetables can be taken, but not beetroot, carrot, spinach, celery, or watercress; and most fruit except figs and sultanas.

The main difficulty arises with bread, butter, and cheese. Fresh unsalted butter can be taken or the salt should be removed from ordinary butter by mashing it in luke-warm water and pouring away the water three times. Unsalted cream cheese, lard, suet, and olive oil are allowed, but ordinary butter, margarine, and most bought cheeses must be avoided. Milk should be limited to a pint (570 ml.) a day, including what is used in cooking, and will go further if it is diluted with half its volume of water. Ordinary bread, cakes, pastries, and cornflakes must be avoided, but oatmeal, macaroni, rice, and sago are allowed. It is becoming less difficult to buy special salt-free bread, and hospital almoners may be able to help by suggesting where it can be obtained. Home-made bread, cakes, and pastries can be taken provided they are made without salt or baking powder.

Drinks can be taken normally except for cocoa, "bovril," and milk beverages. Condiments can be used normally except for salt: "neo-seleron," which is made with potassium, can be taken and serves as a palatable substitute for some patients.

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THE DIABETIC SCHOOL-LEAVER

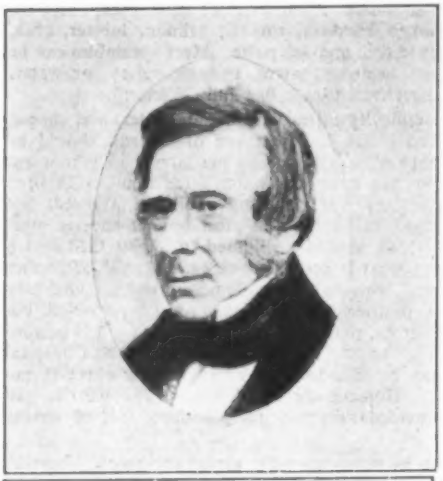
Because, in the experience of the medical advisory committee of the British Diabetic Association, school-leaving reports do not always give a true indication of what a diabetic child can do, the committee has prepared a note on the subject for inclusion in leaving reports. The committee's note is as follows:

"The great majority of occupations can safely be undertaken by the young diabetic, and it is, therefore, easier to consider those which are unsuitable. Regular meals and insulin injections form the basis of good control of diabetes, and occupations in which these cannot reasonably be maintained are unsuitable. This will rule out most forms of shift work, jobs in which the hours of work and mealtimes are subject to considerable variation, and occupations in which physical exertion is severe and also variable. The other group of occupations unsuitable for diabetics on insulin is that in which the consequences of a hypoglycaemic attack may be serious to themselves or other people. In this category must be included the driving of public transport vehicles, such as trains and buses, signal operating, steeplejacking, window-cleaning, and occupations connected with dangerous machinery. Diabetics are not accepted by the fighting Services, and the Merchant Service is not well suited to the requirements of the diabetic.

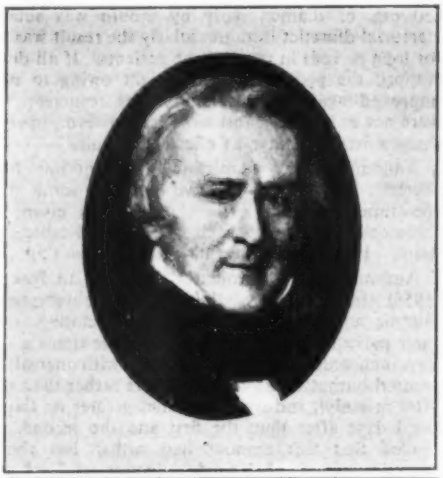
"These suggestions apply to 'average' diabetics—using the term 'average' to cover both severity of the diabetes and the patient's intelligence and understanding of his condition. There are a number of diabetics engaged in some at least of the occupations listed above and carrying out their duties both safely and successfully."

PRESIDENTS OF THE G.M.C., 1858-1958

The first meeting of the General Medical Council was held on November 23, 1858, when Sir Benjamin Brodie was elected President. Sir David Campbell, the 12th President, was elected to this office on November 22, 1949.



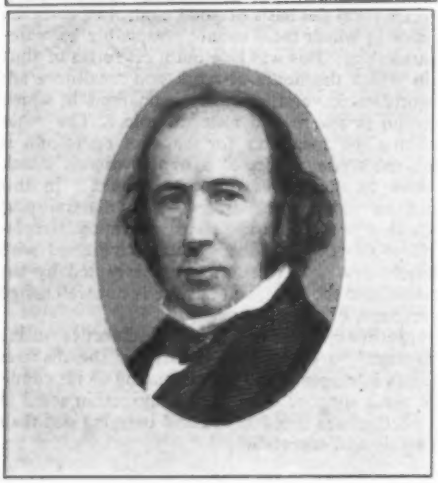
Sir Benjamin Brodie, Bt., F.R.C.S.
1858–1860



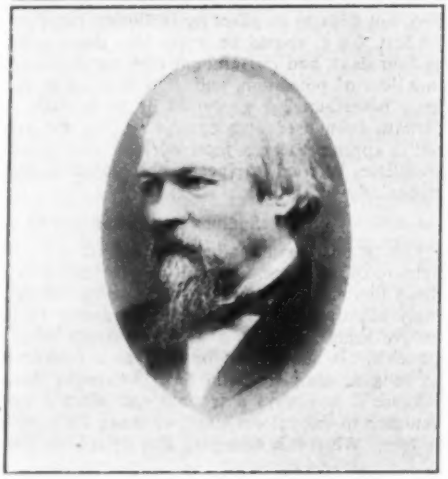
J. H. Green, F.R.C.S.
1860–1863

Sir George Burrows, Bt., M.D.
1864–1869

Sir George Paget, K.C.B., M.D.
1869–1874

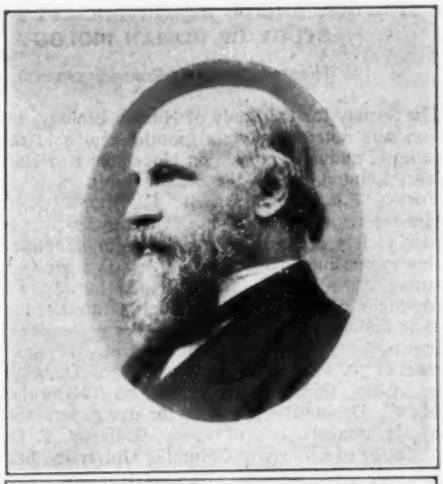


Sir Henry Acland, Bt., K.C.B., M.D.
1874–1887



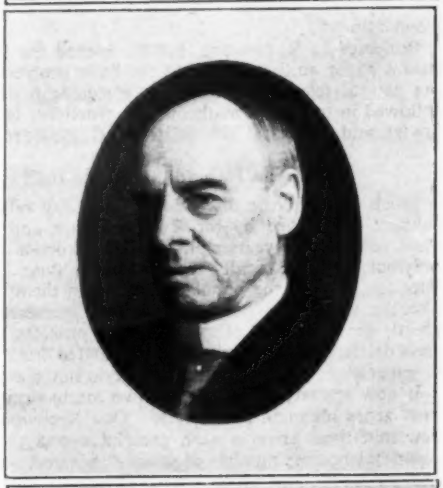
John Marshall, F.R.C.S.
1887–1891

Sir Richard Quain, Bt., M.D. 1891–1898

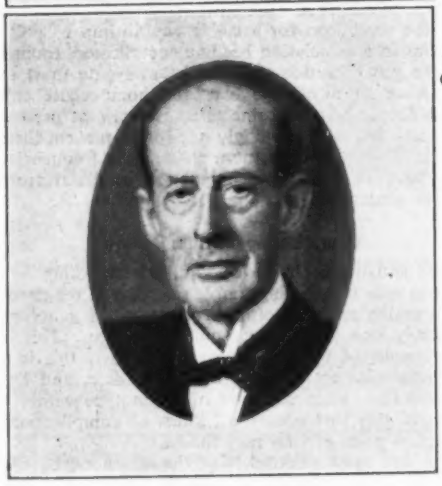


Sir William Turner, K.C.B., M.B. 1898–1904

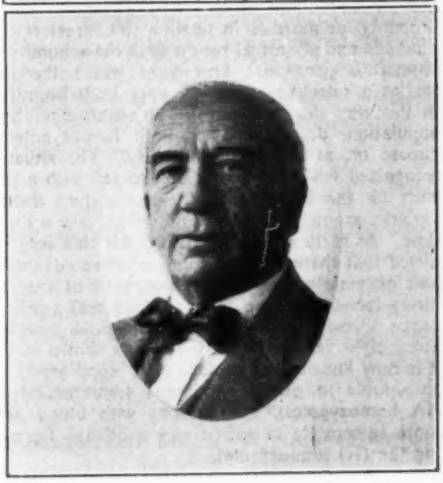
Sir Donald MacAlister, Bt., K.C.B., M.D. 1904–1931



Sir Norman Walker, M.D. 1931–1939



Sir Herbert Eason, C.B., C.M.G., M.S. 1939–1949



Sir David Campbell, *M.C.*, M.D. 1949–

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NATURAL SELECTION IN MAN

SYMPOSIUM HELD BY THE SOCIETY FOR THE STUDY OF HUMAN BIOLOGY

[FROM A SPECIAL CORRESPONDENT]

The Society for the Study of Human Biology, whose formation was noted barely six months ago, held the first of a series of annual symposia on November 8 at University College, London, under the chairmanship of Professor J. Z. YOUNG, F.R.S., and Dr. A. C. STEVENSON, respectively vice-chairman and chairman of the society. It is rare for a new society at once to assume major scientific status, but this symposium made it clear that this group has already succeeded in drawing together the increasing number of top-flight biologists and geneticists interested in applying their findings to man, as well as the professional anthropologists. Undaunted by the difficulty of the topic, they marked their inception in the year of Darwin's centenary by making their first symposium on "Natural Selection in Man." During the course of the day papers were presented by six speakers, one of whom, Professor T. DOBZHANSKY, professor of zoology at Columbia University, had come over specially from the United States, with the aid of the Ciba Foundation.

Professor L. S. PENROSE, F.R.S., opened the proceedings with a paper outlining some of the basic problems concerning natural selection in man. It is significant that he was followed in turn by a mathematical geneticist, Dr. A. R. G. OWEN, and a medical geneticist, Dr. C. A. CLARKE.

How do Harmful Genes Persist?

Much of the basic discussion of the day related to the subject, first raised by Sir Ronald Fisher and Dr. E. B. Ford some fifteen years ago, of what is known as balanced polymorphism. Basically the problem is this: how do deleterious genes in the population maintain themselves when, like the gene for achondroplasia, their possession reduces greatly the number of offspring of their possessors? Clearly such deleterious genes are being eliminated from generation to generation, and yet these diseases do not die out.

It now appears that there are two mechanisms by which such genes maintain themselves. One is obvious enough: new mutations arise in each generation and their number could balance the number of genes eliminated. But there is another mechanism which is at least equally important, and probably far more so in relation to characters carrying less dramatic and abnormal results than the achondroplasia gene. Numerous genes are known in which the heterozygote carries a selective advantage over both homozygotes, and in this way the gene remains in stable equilibrium in the population, despite one or both homozygotes producing disease or, at the least, disability. The situation can be recognized whenever one is confronted with a phenomenon such as the blood groups wherein two distinct genetic varieties are maintained in equilibrium over a long period of time. As early as 1945 Dr. Ford, for this very reason, predicted that there must be some selective advantage in being heterozygotic rather than homozygotic at the ABO blood-group locus, and gave as his opinion that a relationship between blood groups and disease would surely be found. Some eight years afterwards this was shown to be true, and it is now known that persons with blood group A are more susceptible to gastric carcinoma (representing presumably AA homozygotes), and persons with blood group O are more susceptible to gastric and duodenal ulcers (representing the OO homozygote).

Reproductive Advantage of Heterozygotes

Professor PENROSE (Department of Human Genetics, University College, London) said that, by means of this heterozygotic advantage, genes which were disadvantageous in double dose could be kept in the population in stable equilibrium at a level determined by the degree of the advantage of heterozygote over homozygote. If the homozygote is lethal, a very slight heterozygote advantage is all that is needed to hold the balance. For example, in phenylketonuria a 1% increase over average in the reproduction rate of heterozygotes would be enough to maintain the incidence of the disease at its present level. Even in quantitative traits determined by many genes, such as stature or intelligence, this polymorphic mechanism may hold true. The extremes of the traits are likely to represent homozygosity to a greater degree than the centre and may be selected against. Polymorphism, he said, stores up energy against future environmental changes; moreover, the heterozygous advantage in any particular trait may have occurred at some earlier time, as, for example, in conditions of famine or pestilence, and may not still be operative. Such genes would be, in fact, now in process of elimination, but so slowly that we would not be able to see it happening.

He pointed out that the chief selective effect in man, as possibly in most animals, operates through early prenatal mortality. About half of all zygotes formed are believed not to develop to reproduce. This is a startling figure and derived approximately as follows: out of every hundred zygotes about 3 are stillbirths, about 15 die in the early prenatal period, 2 neonatally, and 2 at an early juvenile age, 16 remain unmarried, and 6 marry but do not reproduce. This amounts to 44 out of the 100 being lost. What percentage of this enormous wastage figure is genetical rather than environmental in causation is not of course known, but certainly a good deal is so, and it seems clear that in this way homozygotes at both ends of the scale for many traits must be eliminated.

Dr. OWEN (Department of Genetics, Cambridge) carried these thoughts further in discussing the mathematics of natural selection. It is through such studies, first undertaken by Sir Ronald Fisher and Professor J. B. S. Haldane in Britain and by Professor Sewell Wright in America, that we can say what will happen to the spread of genes through populations, given a certain reproductive advantage for the heterozygote, for example. Dr. Owen pointed out our ignorance of the consequences of any but the simplest genetical situation. We have no models at all for what will happen when selection acts simultaneously on two loci, probably a very usual occurrence in Nature. Even dealing with a single locus the mathematics gets very heavy when more than two or three alleles are considered; and it has become more and more clear in recent years that very many loci in natural populations carry multiple alleles to the tune of 10 or 20 possible genes. When three or more alleles are considered the conditions for a stable equilibrium of polymorphic genes in a population become complicated, though as a rule the generalization that the heterozygote must in some way have an advantage over the homozygote still seems to hold. At least in some circumstances, at present only theoretical, but with seemingly nothing to prevent their occurrence in Nature, two or more stable gene frequencies may occur between which the population oscillates from generation to generation.

Complicating Factors

Even these situations, Dr. Owen said, are over-simplified in that he was only considering simple selection of the genotype, but in reality selection often depends on the genotype plus the family into which the genotype is born. This is true, for example, of the Rh system. Obviously this is a major neglected element in our thinking to date, and Dr. Owen stressed that, when selection of a genotype within a mating type of this sort occurs, all kinds of complications from a selection point of view may follow.

This topic was again referred to in the afternoon by Dr. P. M. SHEPPARD (Department of Zoology, Liverpool). For example, a cde/cde mother makes more antibody to a cDE/cde foetus than to a CDe/cde foetus. Furthermore, in say a Japanese gene complex, perhaps the cde/cde mother may not react in the same way as the European. In Rh sensitization there is interaction also within the ABO system. An O mother with an A foetus swiftly, by means of anti-A,

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destroys the blood of the foetus which leaks to the maternal circulation. Hence there is little time for Rh antibodies to form. In the case of an O foetus in an A mother the foetal cells circulate without ABO opposition and Rh antibodies are more easily developed. Here we have what might be called the second order complication of the selective effect of a gene at one locus, depending not only on the genotype and not only on the mating type with regard to that locus, but additionally on the mating type with regard to a second locus. The consequences of selection of this sort are as yet not at all understood.

"Fitness" of Mutant Genes

Dr. C. A. CLARKE (Department of Medicine, Liverpool) discussed the fitness of several human mutant genes. He emphasized that fitness must be clearly defined in terms of the number of offspring reaching reproductive age as represented by the average age of their parents when the offspring were born. The fitness of any given gene in human populations is exceedingly difficult to estimate accurately. This is partly due to difficulties in diagnosis. It has for some time been becoming more and more obvious that many similar-appearing diseases have different genetical aetiologies —in other words, come from genes at different loci or from multiple alleles giving graded effects at one locus. This is true, for example, of the haemophilias, so that the mutation rate previously given for this disorder is probably considerably too high. The situation also may be confused by phenocopies—that is, environmentally caused disorders barely distinguishable from genetical ones. The deaf-mutism produced by a gene and that produced by maternal rubella are very similar.

Fitness is conditioned, of course, by cultural factors as well as by more strictly biological ones, some diseases conferring a disadvantage in getting married rather than in producing children once successfully mated. Fitness may vary also with environmental circumstances. Colour blindness, for instance, Dr. Clarke pointed out, though usually considered something of a handicap in society, is highly advantageous in collecting Emperor Moth caterpillars from Highland heather.

Professor DOBZHANSKY (Department of Zoology, Columbia) gave a highly interesting account of the operation of natural selection in populations of *Drosophila* that he had studied experimentally. He remarked on the astonishing fact that the chromosomes of biologically successful wild populations of fruit flies carry in single dose enormous numbers of genes which are deleterious in the homozygote. Indeed, the great majority of chromosomes of wild species carry recessives which when brought to double dose reduce viability, often drastically. He described experiments which show how much variability is stored recessively in natural populations, and said that selection operates not as a rule with single discrete genes but with the much less convenient unit of integrated polymorphic systems.

Evolution of Primates

Finally Dr. E. H. ASHTON (Department of Anatomy, Birmingham) brought the meeting back to the old central question of Darwinian days, by reading a paper on the rate of change of primate evolution. Because of the paucity of fossils of primates, despite all the discoveries of recent years, we still can say virtually nothing about this important topic. A colony of green monkeys from Africa was established in the early seventeenth century as a wild population on the West Indian Island of St. Kitts, and a number have been measured after the passage of some 75–100 generations. Differences had in fact been found in the skull and teeth and general body-size between the present St. Kitts monkeys and the present West African parent stock, he said. The difficulty, of course, was to know whether these changes were due to (*a*) the action of the environment at St. Kitts, (*b*) the original selection of the monkeys which went to St. Kitts from the total West African pool, or (*c*) to the action of natural selection changing the genotype of the St. Kitts monkeys. If the last were accepted as a full explanation, which Dr. Ashton thought could by no means be done, the rate of genetic change would be some thousand times that calculated for the evolution of the horse's tooth. In the lively discussion which followed this, as earlier papers, Professor YOUNG suggested that it was time we ceased measuring evolution in terms of the production of numbers of new genera and, forgetting the concept of genus, actually measured the changes in morphology occurring over time. He was supported in this by several speakers, including the professional taxonomists themselves. The technique of handling multiple measurements, developed by the physical anthropologists in association with statisticians minding computers, could now be applied usefully in the field of evolutionary biology. Thus, finally the symposium made the full circle from biology to anthropology and back.

Nova et Vetera

THE "MEDICAL REGISTER"

The Medical Act of 1858, which established the General Council of Medical Education and Registration, included a direction to that body to keep, and to publish each year, a register of all persons qualified to practise medicine. Besides

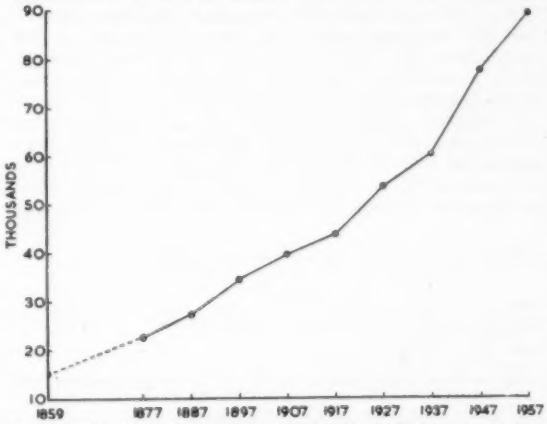

FIG. 1.—Number of names on the *Medical Register* (including temporary registrations), at ten-year intervals.

those holding the qualifications of the medical corporations or medical degrees of the universities mentioned in the Act, persons in practice in England before August 1, 1815, could also be included in the register. The first register, imposing restrictions on those not registered, was to have become operative on January 1, 1859, but the time between the passing of the Act (August 2, 1858) and the following January proved insufficient for the examination of the

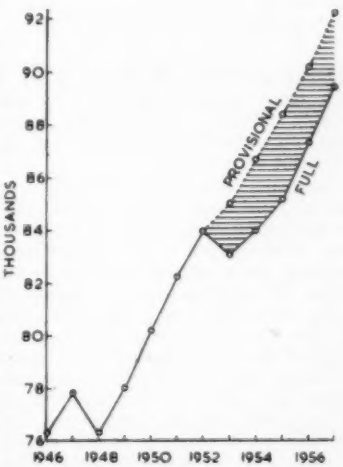

FIG. 2.—Number of names on the *Medical Register*, 1946–57, showing the effect of provisional registration.

credentials of each doctor applying for admission and for the compilation of the register. Amending legislation[1] was therefore introduced, postponing the operative date to July 1, 1859.

Earlier lists of medical practitioners include those published for many years by the medical corporations: the *Medical Register* published by Dr. Samuel Foart Simmons in 1779, 1780, and 1783, which represented the first attempt to gather into one volume particulars of the medical profession and its activities,[2] and the *London Medical Directory* (1845), now the *Medical Directory*. The *Medical Register* for 1859, however, was the first statutory list of those entitled to practise medicine "in any part of Her Majesty's dominions." This first volume, 335 pages in length, was briefly noted in the *British Medical Journal*,[3] which calculated that the number of names included in it approached 15,000. The *Lancet*[4] took exception to the high price (7s. 6d.), and later in the year, the cost of printing having proved less than estimated, the Council decided to reduce the price of future volumes to 4s. and to supply a free copy of the second volume to those who had bought the first. This price remained until 1879, when it was raised to 6s. The 1958 *Register* (2,880 pages) costs 84s.

From 1876 figures are available of names of persons added to, removed from, and remaining on the *Register* each year (see Fig. 1). In that year the number was 22,713, and in 1900 it was 36,355. At the end of 1950 it had risen to 80,222, and the latest available figure (December 31, 1957) is 89,336. This last figure does not include practitioners provisionally registered under arrangements introduced by the Medical Act, 1950. The only appreciable drop in figures occurred in 1948, when the names of over 4,000 practitioners temporarily registered during the war years were removed; there was also a drop in 1953 owing to the introduction of provisional registration (see Fig. 2) as required by the Medical Act, 1950. From 1949 it has been necessary to publish the *Register* in two volumes. The total number of persons registered from 1858 to 1957 was 173,308.

Figures are taken from volumes of the *Medical Register*.

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2. Chaplin, A., *Medicine in England During the Reign of George III*. London, 1919, p. 8.
3. *Brit. med. J.*, 1859, 568
4. *Lancet*, 1859, 2, 93.

To-day's Drugs

With the help of expert contributors we publish below notes on a selection of drugs in current use.

Donnatal Tablets and Elixir (A. H. Robins Co. Ltd.).—Each tablet contains hyoscyamine sulphate 0.1037 mg., atropine sulphate 0.0194 mg., hyoscine hydrobromide 0.0065 mg., phenobarbitone 16.2 mg. Each ml. of elixir is equivalent to one tablet.

The major belladonna alkaloids atropine and hyoscine have two principal actions in the body. The first is on the central nervous system, on which atropine in the small doses recommended in this preparation has an insignificant stimulant effect, whereas hyoscine is sedative and tranquillizing. This preparation in adequate doses might be used for its central effect to combat the tremor of Parkinsonism and for the prevention of motion sickness. The second action of these alkaloids is a highly selective blocking action on effector organs innervated by post-ganglionic cholinergic nerves. Theoretically, therefore, this preparation might be used in a wide variety of conditions, but its main use would probably be in relieving spastic conditions of the gastro-intestinal tract, to which the small dose of phenobarbitone included in the tablet might contribute.

N.H.S. basic price: 50 tabs., 4s.

Marbadal C Vaginal Tablets (Farbenfabriken Bayer A.G., distributed by Levmedic Ltd.).—Each tablet contains marbadal (*p*-aminobenzenesulphonylthiourea salt of α-aminotoluene-*p*-sulphonamide) 0.5 g., stilboestrol dipropionate 0.05 g., with carbohydrates and dispersing agents. Marbadal is said to be a broad-spectrum bacteriostatic effective particularly against anaerobic streptococci, and these tablets are intended for the treatment of infective leucorrhoea and trichomonas vaginitis. The use of a preparation combining a sulphonamide with a synthetic oestrogen for vaginitis is not new. Previous such preparations have not found wide favour among gynaecologists, probably partly because it is doubtful whether administration of an oestrogen per vaginam localizes its action, and partly because from the point of view of sensitization to sulphonamides the vagina has to be regarded as skin. Further, sulphonamides have not yet been proved to be effective trichomonacidal agents.

N.H.S. basic price: 30 tabs., 22s. 4d.

Telmid (Eli Lilly and Co. Ltd.).—For threadworm and for roundworm infections there are already existing treatments which appear to be as effective as is that with telmid, but for infections with *Strongyloides stercoralis* or *Trichuris trichiura* or both together no satisfactory anthelmintic drug has hitherto existed. These two infections seldom produce symptoms; treatment is therefore but seldom required, and in the majority of cases the infection is best ignored. Very occasionally, however, patients—usually small children—may become very heavily infected with *Trichuris trichiura* and may then suffer from diarrhoea and occasionally even prolapse of the rectum. It is in infections of this kind that telmid is of greatest usefulness. In such infections it may be given to children under 5 years in doses of 100 mg. twice daily for five days, for those 5 to 10 years in two doses of 200 mg. twice daily for a similar period, and for those over this age the same amount may be given thrice daily, also for five days. For strongyloides infection the same dosage may be continued for ten to fourteen days. For threadworm infections in children aged under 10 100 mg. may be given twice daily, and for persons over 10 years of age 100 mg. thrice daily, for five days. The tablets are administered orally after meals; they are insoluble, not absorbed, and are believed to kill the worms by disturbing their enzyme systems. Nausea, vomiting, and abdominal discomfort are not uncommon side-effects of the treatment.

N.H.S. basic price: 100 tabs., 38s. 2d.

Provell Maleate (Eli Lilly and Co. Ltd.).—Tablets containing 0.5 mg. of protoveratrine A and B maleates. Protoveratrine is the principal alkaloid of *Veratum album*, and is a mixture of two ester alkaloids, protoveratrine A and B.

Parenteral injection causes a fall in blood pressure, peripheral vasodilation, and bradycardia. Renal blood flow is usually unchanged. After 0.15–0.2 mg. intravenously the blood pressure and pulse rate reach their lowest levels in 10 minutes, returning to the original level in 2–3 hours. The maximum fall in blood pressure occurs in 3–4 hours after oral administration. Side-effects include a feeling of warmth in mouth and chest, paraesthesiae, nausea and vomiting, and often hiccup.

Atrial fibrillation has been reported to revert to sinus rhythm, and episodic nodal rhythm to alternate with sinus rhythm. The fall in blood pressure after oral administration is almost entirely due to protoveratrine A, while protoveratrine B appears to be fully effective only by injection.

The drug may be given 3–5 times daily, the dose being gradually increased until the blood pressure is controlled or severe side-effects occur. Protoveratrine is not as effective a hypotensive agent as the ganglion-blocking drugs, and side-effects may be unpleasant enough to prevent successful treatment, but the administration of it is worth considering when ganglion-blocking agents are contraindicated.

N.H.S. basic price: 100 0.5-mg. tabs., 21s. 4d.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Pharmaceutical Houses and the Doctor

SIR,—I was interested to read the report on "The Pharmaceutical House and the Doctor," by Dr. Audrey Z. Baker (*Journal*, November 1, p. 1095). I wonder whether any other doctors suffered as I did after completing the questionary. During the next five days I was besieged by twelve different medical representatives, each asserting that his firm's products were more effective and "relatively" cheaper than the next man's.

Like many other general practitioners I am single-handed and have no receptionist to shoo off these strong, but far from silent, young men. Out of courtesy I agree to listen to them for what becomes an eternal two minutes. It is not that I dislike these charmers personally. I have a soft spot for many of them. Ideal companions at a dance or cocktail party; on a Monday morning, during a crowded surgery, even their cheerful exuberance can be a source of irritation. How I admire my colleagues who raise hands and eyes to Heaven, shake their heads, and depart, leaving the engaging persuaders to waste their sweetness on the desert air.

The glossy literature piled high on the breakfast table, and delightful representatives who grace our drives with their shiny new cars, are nothing more than an insult to our intelligence as doctors. When I need guidance on the latest methods of treatment for my patients I naturally turn to the consultants and ask their advice. This they give modestly, honestly, and without bias or high-pressure salesmanship patter.

We general practitioners have borne the brunt of these attacks for long enough and now we must unite and fight these pharmaceutical firms who, using all the wiles and subtleties known to advertisement psychologists, try to degrade our profession by badgering us into using their drugs. They have studied us and worked upon us as if we were a band of immoral morons, who, if bribed with free gifts and outings and given free samples and pretty pictures by well-groomed men of charm and wit, will prescribe anything they happen to suggest to us. Several times I have been embarrassed by being asked why I prescribe A's products instead of B's products by B's representatives, the said representative having visited the local chemist during my morning surgery and jealously watched my prescriptions pouring in for the products of some other laboratory. I am sometimes told that I *ought* to use a certain brand of product in preference to anyone else's because their firm was the first to make it.

The fault, though grave, is not only unilateral. We ourselves are in danger of remembering the names of proprietary products which appear daily before us on paper-knives, wallets, booklets, diaries, and telephone pads, and forgetting much of the valuable material so neglected nowadays in the *British Pharmacopoeia*. We are slowly becoming marionettes who dance when the strings are pulled by the big drug houses. Let us try to reverse the process before it is too late.

I am a simple family doctor and know little of governing bodies, but I have been wondering why there is no body of men to deal with all these proprietary products, their potency, price, and effectiveness. Individually, we have no time to compare the various preparations and decide which is the best. I am thinking particularly of the more expensive antibiotics. For example, oral penicillin is made under many different trade names, in different strengths, colours, quantities, flavours, and prices. To decide which one is most effective and most economical is wellnigh impossible for the average general practitioner. Let us have a central body to do this tedious job for us. It could check the products of all firms and pass only the best. This would save the national purse from being robbed by large international laboratories. It would also help us G.P.s to cut down on our drug tariffs and save ourselves the indignity of having our prescribing habits probed.

I shall be accused of trying to kill the competitive spirit amongst manufacturers. Not at all. They can start measuring their products against each other's scientifically. Like the strong men at the fair, they can measure the strength of their medical punches on a special machine instead of on our heads. The one who rings the bell will have all his goods passed into the pharmacies for our use. Those who fail to do so will have to raise their standards. Let us have our drugs as pure and undefiled as possible, so that our pharmacists can return to the noble art of dispensing once more. They are wasted to-day, handing out "proprietaries" over the counter in exchange for E.C.10's and filling in time by selling cosmetics, contraceptives, and tooth paste. If, for example, penicillin came in the form of a white powder, it could be dispensed together with the colour and flavouring that we, or our patients, prefer.

Since the N.H.S. Act, we doctors, apart from those running dispensing practices, either privately or in rural areas, have on the whole grown slack and lazy. We find it quicker to write snappy trade names instead of the *B.P.C.* equivalent. Let medical students learn at the bedside more about the medicines and tablets administered to the patients. Let them be encouraged to take pride in writing prescriptions correctly themselves, for most of them will spend much of their time doing so in general practice. Maybe this is so now, but in 1942–7 when I was a student, rightly or wrongly, I gained the impression that prescribing was something that one could "pick up" afterwards. Unfortunately this attitude is the chink in our armour which leaves us vulnerable to these attacks on us. Before departing from the protective walls of our medical schools and hospitals, let every young doctor who intends to hold his uncovered head high in general practice be the proud possessor of a good pharmacopoeia. In it he will find prescriptions for drugs which have stood the test of time and still relieve or cure as effectively to-day as the day on which they were first used.—I am, etc.,

Birmingham, 30. MARY M. RAYNER.

SIR,—The latest postal advertising effort of one drug manufacturer, featuring on the outside of the envelope a diagram of the urinary system on a female torso, is in such bad taste as to make especially offensive that firm's vaunted claim to be English. It is time we doctors protested against this growing and unethical habit of advertising drug wares on the outside of envelopes and on postcards. No doubt the sender hopes it will catch the eye as it is being consigned straight to its proper place, the waste-paper basket. We need not prescribe such products.

This exploitation of every trick of advertising to push sales goes with a marked tendency to play down the price of the drug, if indeed it is mentioned at all. Where one troubles to find out the cost, and those of us who dispense have to pay every month for what we order, the results are sometimes startling; for example, over £6 per patient per attack of bronchitis if one maker's suggested routine is followed. In fact, as we all know, the cost is sometimes so high that the manufacturer takes the offensive and seeks to blunt the critical faculties of those he hopes will prescribe his drugs with a barrage of glossy advertisements, technical magazines, news sheets, and even handkerchiefs and luminous car-key rings. Not all firms behave in this way, fortunately.

In these matters one looks to the Minister of Health for a lead. Surely he could at least indicate definitely for what maximum period any one prescription for those on prolonged treatment should be made out. I personally give a month's supply in such cases. What do patients think when other doctors perhaps give twice that amount for the same one shilling tax? They should respect one for trying to act responsibly to the nation as a whole, and that goes for drug manufacturers, too. Do they? You know the answer.—I am, etc.,

Mattishall, Norfolk. CHARLES S. THOMSON.

Halothane Concentration

SIR,—Dr. David G. Hurter's suggestion (*Journal*, October 18, p. 979) cannot possibly pass unchallenged. All of us who have used halothane for some time must have come to the conclusion that the potency of this inhalational anaesthetic is so great that a difference of 0.2% in the vapour concentration may mean adequate anaesthesia on one side and overdosage on the other.

The level of vapour concentration required varies from case to case and also depends on other factors, such as type of operation and duration of anaesthesia. Dr. Hurter suggests that safety of anaesthesia lies in the fact that the minimum amount of anaesthetic should be used and that this can be best achieved by giving test doses. If this is so, then the baseline to which the test dose refers must be both known and constant. Surely it would be highly dangerous to administer a test dose of morphine of, say, 50 mg. It is no less dangerous to administer a test dose of halothane of unknown vapour-concentration; severe hypotension and possibly cardiac distress may follow with great rapidity; and the anaesthetic agent is blamed instead of the unwise method of administration. Would Dr. Hurter agree to someone's suggestion that cyclopropane should be administered using an uncalibrated rotameter?

Halothane is a potent and—in safe hands—safe anaesthetic agent. But I would certainly not allow any of my registrars to use it—nor would I do so myself—except strictly according to the rules: 50% nitrous oxide and oxygen, Waters's canister, fluotec vaporizer, controlled respiration, and E.C.G. control from time to time. Nothing less will do.—I am, etc.,

Boden, 19, Sweden. ERIC A. FRAYWORTH.

REFERENCE

Frayworth, E. A., *Observations on the Use of Fluothane*, 1938, H. K. Lewis and Co. Ltd., London.

Ergometrine with Hyaluronidase

SIR,—Mr. W. G. MacGregor in his letter (*Journal*, November 8, p. 1165) states that "manual removal of the placenta in a fit patient is without risk." Unless skilled endotracheal anaesthesia and suction apparatus are available, absolute asepsis can be achieved, and rupture of a possibly thinned uterine wall can be excluded, manual removal of the placenta cannot be without risk.

I would suggest that, at any rate in general practice, it is safer to risk a haemorrhage before the delivery of the placenta, which can be treated with intravenous ergometrine in 45 seconds[1] should it occur, than to give ergometrine with the anterior shoulder and risk a retained placenta.—I am, etc.,

Drayton, Norfolk. JOHN N. GALE.

REFERENCE

[1] Embrey, M. P., and Garrett, W. J., *Brit. med. J.*, 1958, 2, 138.

Bronchograms for Asthmatics

SIR,—I used to face the prospect of doing a bronchogram on an asthmatic subject with some trepidation. They are usually nervous patients, and the anaesthetization of the larynx used to bring on an attack of bronchospasm. If we persisted with the instillation of opaque medium the bronchogram was often not a good one, and I have heard of a fatality occurring.

I now give 25 mg. or more of hydrocortisone hemisuccinate intravenously either before or after the local anaesthetic and find this overcomes the difficulty. This use of hydrocortisone might be extended to pre-operative medication before a general anaesthetic, though of course the spasm usually wears off once the patient is deeply anaesthetized.—I am, etc.,

Bevendean Hospital, Brighton. FORDE CAYLEY.

Tuberculous Meningitis after B.C.G.

SIR,—It is always most interesting to hear of tuberculosis in those who have been vaccinated with B.C.G. But the description by Drs. Mary R. Kerr and J. M. Dunbar (*Journal*, October 25, p. 1019) is not detailed enough. We are told that this child of 11 months, in contact with tuberculous parents, did not react to tuberculin. But when, by which route, and in what strength was the tuberculin given? Contrary to Calmette's advice, she was not isolated after being vaccinated, it seems, and she was not retested until eight weeks later. It is impossible to tell, therefore, whether she was vaccinated during the ante-allergic phase or became infected immediately after vaccination.

Cases like this are known to occur and are not surprising. Unfortunately they tell us nothing fresh about the degree of protection provided by B.C.G.—I am, etc.,

Paris. ROBERT DEBRÉ, President, Académie Nationale de Médecine.

Prevention of Lung Cancer

SIR,—I ask your hospitality for an attempt to clarify the position of a coroner in this controversy. A registered medical practitioner has a duty to issue, in the prescribed form for the registration of death and if he is asked for it, a certificate that he has been in attendance upon the deceased in his last illness and of the cause of death to the best of his knowledge and belief. He has no duty, no matter how general and how useful the custom may be, to report a death to the coroner and may, quite properly, certify, as example, that death is due to "haemorrhage due to penetrating wound of the heart." The fact that such a certificate is quite useless for registration purposes usually deters its issue, but does not remove the obligation of the doctor.

The registrar of deaths must refuse to register any death which he himself has reported—which some other person must report (e.g., a death in prison)—or which he knows has been reported (e.g., from the fact that "space A" on the prescribed certificate has been initialled) to the coroner, until he has received a coroner's certificate (after inquest) or a notification that the coroner does not intend to hold an inquest. The registrar must himself report certain deaths to the coroner. The relevant category here appears to be: "If the death is one . . . which appears to the registrar from the contents of any medical certificate to have been due to abortion, industrial disease of the lung or other industrial disease or poisoning (including food-poisoning)" (Registration (Births, Stillbirths, etc.) Regulations, 1954, section 82 (1) (g)). Even where the certificate does not refer to a specific industrial disease or poison, the registrar has certain "Notes for Guidance" which lead him to report to the coroner, as examples, deaths from "fibrosis of the lungs" or "cirrhosis of the liver" as suspicious of silicosis or alcoholism respectively and likely to lead to inquest verdicts of "from an industrial disease" or "from chronic alcoholism."

It may now be apparent why an inquest was held in a recent death from cancer of the lung. Basically it was because the registrar referred the case to the coroner. The certified cause of death was "carcinoma of bronchus due to excessive cigarette smoking." It was not, and could not be, suggested that the medical practitioner had issued a certificate that was illegal or not "to the best of his knowledge and belief." It was, perhaps, unfortunate that a red herring was trailed by the use in the certificate of the word "excessive" as an epithet to describe the cigarette smoking said to have caused the lung cancer. The certificate requires only an opinion and not the reasons for that opinion, and the use of the word "excessive" merely denotes an inquiry into the patient's habits which would be expected but not be of legal significance. "Due to excessive cigarette smoking" appears to me to be as much a verdict as "due to chronic alcoholism," and it could only appear, as such, in the registered cause of death as a verdict after inquest at which the fact

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of cigarette smoking to excess had been established by the reception of best evidence.

A verdict of accidental death is, clearly, inappropriate where the incidents are repetitive, frequent, and undated, as in the case of the cigarette addict, but I submit that a verdict of "due to excessive cigarette smoking" might be a proper verdict provided that its return is supported by evidence of the fact of smoking as to duration and amount and by evidence by a duly qualified expert witness that smoking in that amount has led to death in that case.

I am not competent to enter into the discussion of the connexion between cigarette smoking and cancer, whatever my own opinion may be; and, indeed, as a coroner, I may only assess that connexion from case to case as I may be called upon to do so, basing my finding upon the evidence I receive. I am, however, in entire agreement with Drs. Norman Macdonald and Wilfred Lester (*Journal*, November 15, p. 1227) when they assert a legal right and an ethical duty to connect cancer with smoking, or indeed any terminal illness with any other habit, if they do so, upon a certificate for the registration of death, "to the best of their knowledge and belief," Their right to do so is not new, but they must be prepared to testify to their knowledge and belief on oath, and, even, to listen to contrary evidence which may prove more acceptable in any given case or to any other coroner.—I am, etc.,

R. IAN MILNE,
H.M. Coroner, County of London (Southern District).

SIR,—The letter from Dr. G. B. Forbes (*Journal*, November 1, p. 1104) is exactly the reply that I felt ought to be made to the letter from Mr. Leslie J. Temple (*Journal*, October 4, p. 858) when I first saw it a few days ago. However, since then there has been a case appearing in the public press where a coroner is reported as having said that if the medical witness had omitted the qualification "excessive" from his opinion that a death from carcinoma of the lung was due to smoking nobody would have quarrelled with him. The reason for that was not made very clear in the report I read (*Daily Mirror*, October 30), but the presumption appeared to follow that, in the absence of the word "excessive" used in the medical evidence, the coroner would have reached a verdict of "accidental death" rather than one of "natural causes."

In general, the evidence that smoking is a cause of cancer of the lung is beyond reasonable doubt, though we must be careful to allow that even in the case of a heavy smoker the disease may not have been connected with the habit. In minimal cases it is difficult to draw the line, but, as the coroner pointed out in the case referred to above, one could not quarrel with a doctor who gave it as his opinion that smoking was a cause of lung cancer where the habit had amounted to smoking 40 or 50 cigarettes a day. It might not be fair, either, to regard the doctor's evidence in such cases as propaganda. A doctor who is genuinely convinced that smoking is even no more than a probable contributory cause of death is right to report it to the coroner. Likewise a coroner who accepts such medical evidence and opinion and incorporates it in his verdict is doing no more than his duty as it is customarily interpreted.

The custom of giving the benefit of the doubt on the side of an accidental cause has probably been encouraged out of sympathy amongst coroners for a deceased's relatives who may depend upon the success of a claim in another court. This is particularly relevant to the type of industrial "accident" alluded to by Dr. Forbes, but the practice of incorporating an accidental contributory cause of death in a verdict on the basis of probability is by no means confined to cases with this practical significance. The case of the old lady dying of bronchopneumonia or some other natural cause following accidental fracture of a bone is a well-known example of "accidental death." A closer parallel is perhaps provided by an inquest held in February, 1956, by no less an authority than Sir Bentley Purchase. Here a verdict of "accidental death" was recorded in the case of a man of 63 who had worked for 40 years in a firm making an arsenical sheep dip and who died of multiple skin carcinomata with secondary deposits in the chest. The relationship of arsenic to the cancer is similar to that of smoking, and the verdict was no doubt returned by the jury with a due sense of its significance in connexion with a compensation claim. Perhaps we shall soon see notices on cigarette cartons disclaiming the manufacturer's liability for possible ill effects following use of their contents.

In the continued absence of any official pronouncement, it appears to be certain that before long we shall have a verdict of "accidental death" in a case of lung cancer in which there is a history of smoking. The probability of smoking as a cause compels consideration of it in general, and the probability of it being at least a contributory cause in a case where smoking habits are known can now be fairly accurately assessed. Although an "open verdict" is permissible, coroners endeavour to avoid this and prefer to find on the basis of reasonable probability in the light of available medical evidence in the case. As medical knowledge increases we may hope that many of the "natural causes" of death will be reclassified into the "accidental" category and therefore become avoidable. If nothing worse than the loss of smoke is involved our longer lives should remain worth living—with the possible exception of those of coroners if called upon to decide whether deaths resulting from established but fatal dietary and other habits are to become and remain their concern.—I am, etc.,

Eye, Suffolk. J. SHACKLETON BAILEY.

SIR,—I have read the letter of Dr. G. B. Forbes (*Journal*, November 1, p. 1104), and although I have been anxious to avoid entering a controversy on this subject, I feel some reply from me is demanded. Many years ago, I did in fact once report a death from cancer of the scrotum in a mule spinner to the coroner. Had I been asked, "Is it possible for one who has never been in a cotton mill to get cancer of the scrotum?" and, "Is it possible to be a mule spinner for the whole of one's adult life and escape cancer of the scrotum?" the brief answer to both questions would have been "Yes." The brief answer, however, would not have been enough—nor is it to the similar questions in Dr. Forbes's letter.

Dr. Forbes doubts if the coroner's court is the proper platform for propaganda. As I see it, the alternatives are these:

(1) *Legal Steps to Prevent all or Excessive Cigarette-smoking.*—Not only would this fail as prohibition of alcohol has failed elsewhere, but it would constitute an unwarrantable interference with the liberty of the subject. Any man should be allowed to take the known risks of acquiring lung carcinoma if he wants to.

(2) *A Nation-wide Publicity Campaign on the Best Advertising Agency Lines.*—All the political parties have had experience of how such campaigns may fail to convince the public, and, anyway, no Government would pay for a campaign that—if it succeeds—is going to put its Chancellor's next Budget in jeopardy.

(3) *Seeing that the Public Gets the Facts Without Emotionalism or Conscious Propaganda.*—At present, they are largely denied the facts, by the very proper attitude of doctors, who do not discuss the diagnosis of individual patients with any but the closest relatives. None of us would wish to see it otherwise. A report to the coroner, however, and the subsequent inquest would ensure that Bill Smith's friends, workmates, or fellow-directors would know that he died of cancer of the lung which his doctor thought might be connected with his habit of smoking 40 cigarettes a day. They might shrug this off at first, but when John Jones and Fred Brown, working in the same factory and also smoking 40 a day, are known to die of lung cancer, the other people in the factory—who are not unreasonable if they do not think they are being "got at"—might at least go home and stop their offspring starting to smoke cigarettes.

I submit that the coroner is the proper person to issue warnings regarding dangerous practices. He has done so effectively in the matter of amateur electrical wiring, un-

fenced ponds, and unprotected machinery, to name only a few, and the general public have learned to respect his advice. I do trust that in the near future he is going to advise them on this much more prevalent danger.—I am, etc.,

Liverpool, 1. LESLIE J. TEMPLE.

More Diphtheria

SIR,—Under Vital Statistics in your issue of October 25 (p. 1051) I read that "the 25 cases of diphtheria notified in England and Wales in the week ending October 11 were the largest total for nearly three years." In view of the attention now being paid to the more formidable danger of poliomyelitis and the campaign of inoculation against polio, is the demand for immunization against diphtheria tending to slacken off?

In a paper[1] I gave in the Section of Hygiene and Public Health at the Annual Meeting of the B.M.A., at Belfast, in 1937, I said that "with a general extension of the practice of active immunization to the whole child population, this country could in a generation remove diphtheria from its place among the deadly diseases of childhood"; and in the *Monthly Bulletin of the Ministry of Health*,[2] I pointed out that the immunized girls of to-day are the mothers of to-morrow, and that in the absence of subclinical natural infection (a sequel of mass immunization) circulating antitoxin will not continue at a high level; thus their infants will be born without protection against diphtheria, and in any case such protection is fleeting. I therefore advised that every expectant mother should have either a reinforcing dose at the eighth month of pregnancy if previously immunized, or two doses during pregnancy if not previously immunized. The infants should also be breast-fed to ensure passive immunity and should be actively immunized within a month of the cessation of breast-feeding.

Are there certain areas of the country in which child immunization has not actively been carried out and where the absence of diphtheria for a number of years has reduced the opportunity of mother and child acquiring some degree of active immunity by subliminal doses of diphtheria toxin?—I am, etc.,

Poole, Dorset. GEORGE CHESNEY.

REFERENCES

1 See *Brit. med. J.*, 1937, **2**, 344.
2 *Monthly Bull. Minist. Hlth Lab. Serv.*, 1945, **4**, 144.

Allergic Encephalomyelitis

SIR,—Your leading article on allergic encephalomyelitis (*Journal*, November 1, p. 1089) was very welcome in stressing the similarity of this phenomenon to auto-immune reactions involving other organs such as the thyroid gland. However, the article repeated some statements which have been made elsewhere which might create some wrong impressions in those not very familiar with the subject.

Although it is agreed that there is a still unknown substance present in central nervous tissue which by its injection causes severe neurological lesions, the identification and purification of a compound from bovine spinal cord having these properties has in fact been reported by Roboz, Henderson, and Kies[1] and its activity in quite small amounts has been demonstrated by Kies, Alvord, and Roboz.[2] This substance, which has been obtained in a very high state of purity indeed, is a fibrous collagen-like protein which is perhaps derived from the blood vessels or ground substance of the nervous system. There is no evidence as yet that it is derived from myelin. Since this is the first identified and homogeneous agent made from the nervous system having definite encephalitogenic activity it does deserve some mention. It has also been shown that this protein induces encephalomyelitis not only with intact acid-fast bacilli but also in the presence of purified fractions and even a pure chemical substance made from such bacilli.[3,4]

The unqualified statement that a connexion between exanthematous infection and encephalomyelitis has not yet been successfully shown experimentally is open to question, as Terai[5] has produced a demyelinating encephalomyelitis in rabbits by means of injections of vaccinia virus conjugated with white matter phosphatide. I feel that these points might be of interest even to those not engaged in this field of research.—I am, etc.,

M.R.C. Rheumatism Research Unit, Taplow, Maidenhead. JACK COLOVER.

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1 Roboz, E., Henderson, N., and Kies, M. W., *J. Neurochem.*, 1958, **2**, 254.
2 Kies, M. W., Alvord, E. C., jun., and Roboz, E., ibid., 1958, **2**, 261.
3 Colover, J., *Nature* (*Lond.*), 1958, **182**, 104.
4 —— *Proc. roy. Soc. Med.*, 1958, **51**, 745.
5 Terai, H., *Folia psychiat. neurol. jap.*, 1955, **9**, 20.

Death from Asian Influenza

SIR,—In your leader on the above subject (*Journal*, August 16, p. 434) you quote Flewett and Hoult's[1] opinion that comatose fatalities in Asian influenza can be regarded as due to encephalopathy produced by severe cerebral anoxaemia and venous congestion associated with the haemorrhagic pneumonia. As we[2,3] have already pointed out, necropsy findings in these cases do not support this view of the pathology. Whenever detailed histological study of the brain has been undertaken, as advised by us, it has shown that the lesion is an acute haemorrhagic leuco-encephalitis, as described by Crawford.[4]

We think that it is important to recognize this pathological condition in view of the possibility that it has an allergic basis and that modern anti-allergic therapy if instituted sufficiently early may influence the outcome. Many cases probably die with the true cerebral condition undiagnosed, and therefore untreated. Cortisone or its derivatives seem to be urgently indicated as a trial in conjunction with suitable antibiotic cover.—We are, etc.,

R. A. GOODBODY.
Royal South Hants Hospital, Southampton. R. J. MCGILL.

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1 Flewett, T. H., and Hoult, J. G., *Lancet*, 1958, **2**, 11.
2 McGill, R. J., and Goodbody, R. A., ibid., 1958, **1**, 320.
3 Goodbody, R. A., and McGill, R. J., ibid., 1958, **2**, 156.
4 Crawford, T., *J. clin. Path.*, 1954, **7**, 1.

Virus Diseases in Pregnancy

SIR,—In February of this year I examined a 7-year-old girl who had latent nystagmus, high myopia, and fine pigmentary "degeneration" of the macula. The correction of her short-sight (7 to 8 dioptres spheres with 1 to 2 dioptres cylinders) allowed J.2 and 6/24 vision, uni- or binocularly. Her birth was full-time and her mother's eyes were normal. During the second month of pregnancy her mother suffered her first attack of aphthous stomatitis. Furthermore, at the time of examination there was an active but symptomless ulcer on her mother's soft palate. There was no history of Behcet's syndrome.

If aphthous stomatitis is due to a virus, it may infect the embryo. Because the ulceration may be silent, it may be overlooked. None of my colleagues has seen a similar case with such a history, and I should be glad to know if any of your readers have done so. In view of the apparent absence of references to aphthous stomatitis as a cause of embryopathy, investigation of the possibility may be worth while.—I am, etc.,

Ballina, Co. Mayo. G. E. HEWSON.

Crime and Mental Illness

SIR,—After reading your leading article "Open Doors" and the annotation "Disordered Society" (*Journal*, November 8, pp. 1150 and 1154), it does not seem unreasonable to wonder whether there may be some connexion between the "liberalizing mood" with regard to mental treatment on the one hand and the "deep disorder in society," characterized by the recent increase in crimes of all types, on the other.

One particular form of crime—namely, assaults upon children—was mentioned in a recent speech by the Home Secretary as one which was disturbingly on the increase. That the perpetrators of such crimes are, at any rate temporarily, mentally disordered would appear to be undeniable. How many such crimes have been committed, for example, by patients on parole from hospital, by patients under psychiatric care in the community, or on licence from mental deficiency institutions, or by patients who have had, perhaps, too precipitant a discharge from hospital or from Order under the Mental Deficiency Acts? I do not know that these figures are readily available. It occurs to me, however, that it would be relevant to inquire very carefully into such matters, and into statistical relationships between mental disorder in all its aspects and crime, with particular reference to sexual assault and crimes of violence, before proposed legislation based upon the report of the recent Royal Commission on the Law Relating to Mental Illness and Mental Deficiency, which recommends yet further liberalization, reaches its final stages.—I am, etc.,

Sandhill Park Hospital, Taunton. M. P. NELSON.

Post-parotidectomy Gustatory Sweating

SIR,—Whilst I enjoyed the article on the mechanism of post-parotidectomy gustatory sweating by Messrs. D. H. Glaister, J. R. Hearnshaw, P. F. Heffron, A. W. Peck, and Mr. D. H. Patey (*Journal*, October 18, p. 942), I would like to criticize their opinion on the causation on several grounds.

The theory of aberrant regeneration not only postulates that the parasympathetic fibres to the parotid gland are injured but that at the same time and in the same place sympathetic fibres distributed to the area of supply of the auriculo-temporal nerve should be cut. This means that the trunk of the nerve would have to be injured, an event which would be unlikely in a parotidectomy and much more unlikely in a simple incision for abscess. All that one can guarantee to injure in these operations are branches of supply to the parotid gland which may later be distributed to the skin. They might on this theory give sweating localized to that branch's area of supply alone, but not to other areas supplied by the auriculo-temporal nerve.

In the apparently rarer cases of gustatory sweating after operations in the vicinity of the submandibular gland, the sweating in one case[1] was in the area of the anterior cutaneous nerve of the neck, and had thus no direct connexion with the glandular parasympathetic supply via the lingual nerve. In another case,[2] the area affected would appear to be that of the greater auricular nerve. In neither of these cases is it possible for the affected sympathetic fibres to be injured in the same place as the parasympathetic supply.

Coldwater[3] states that after resection of the auriculo-temporal nerve in this syndrome in two cases there was in both an area of residual sweating which corresponded to the area of supply of the zygomatico-facial branch of the fifth nerve. I would be glad to know whether this has been observed in any of the cases Glaister *et al.* have seen.

I would like to suggest a modification of their explanation. The sympathetic fibres distributed to the sweat glands in the surrounding skin may enter the cutaneous nerves proximally, as shown in their diagram on page 943, via the middle meningeal plexus, or distally from terminal branches of the external carotid artery. If these fibres entering distally are injured by the glandular excision at the point at which they are still perivascular, and the cut parasympathetic fibres in the gland grow along their vacated neurilemmal sheaths, then gustatory sweating could be produced. This would explain: (1) The absence of gross sensory impairment in areas which sweat. (2) The lack of exact correspondence with the distribution of any one cutaneous nerve. (3) The existence of thermal sweating in the same area as gustatory sweating. (4) The recurrence of sweating when apparently large amounts of auriculo-temporal nerve are avulsed.

If this theory is correct, then gustatory sweating should be commoner in those operations in which vascular damage is greatest, as, for example, when the external carotid artery is divided.

The elicitation of "thermal salivation" is a neat and pleasing experiment. I rather hesitantly suggest that it might be as effective to cool the patient down to elicit salivation, as, if the sympathetic is innervating the parotid gland remnant, then it may be doing so with vasoconstrictor fibres (as well as fibres intended for sweat glands), which would reduce their stimuli whilst heating occurred and increase it on cooling. This might partly reduce the salivary flow due to heating. I suppose that this was not considered because one would not expect adrenergic vasoconstrictor fibres to be able to stimulate structures normally innervated by cholinergic fibres. I may justify this suggestion by pointing out that flushing is after all a part of this syndrome. If we are able to think that the sweating is due to parasympathetic aberrants then the flushing might be due to the same cause. This would thus be an effect of cholinergic fibres on normally adrenergically supplied blood vessels.—I am, etc.,

Department of Surgery, University of Manchester. K. BLOOR.

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[2] Langenskiold, A., *Acta chir. scand.*, 1946, **93**, 294.
[3] Coldwater, K. B., *Arch. Surg.*, 1954, **69**, 54.

Sex Education for Students

SIR,—In the annotation on "Sex Education for Students" (*Journal*, October 25, p. 1029), it was stated that "some students are scarcely sufficiently mature and stable to accept the emotional effort entailed in studying a subject of this kind." In the event of this being so, how are such immature and emotionally unstable young men and women expected to cope with, and attempt to understand the questions and mental crises of, the dying and those in fear of death? Such problems confront the student at an early stage in his clinical career, and are only finally overcome when the student has learnt to carefully examine his own thoughts and feelings.

It was regrettable that the views expressed in your annotation showed so little insight into the student's mind.—I am, etc.,

The London Hospital Medical College, London, E.1. W. LL. PARRY-JONES.

Informing the Hospital

SIR,—I should like to thank Dr. W. N. Leak (*Journal*, November 1, p. 1104) for his information that the problem of drug identification is one that is engaging the Joint British National Formulary Committee. This is most encouraging. But I wish to correct Dr. Leak's impression that my collection is intended to be complete: it is only an attempt to provide a guide to the drugs commonly used in psychiatry.

In the same issue of the *Journal*, (p. 1105) Dr. Jane M. Fullerton refers to the excellent "Tablet and Capsule Identification Guide" produced by the *Chemist and Druggist*. The original Guide was published in 1956, and a Supplement to it was published in June, 1958. It warns "the charts must be used with great care and discretion," that "the guide is necessarily incomplete," and that "no guarantee can be given that any further supplements will be published." In spite of this Guide I feel sure that Dr. Fullerton would agree that a guide cannot replace a system of identification which would enable us to keep pace with every new drug.—I am, etc.,

London, E.8. NORMAN GOLD.

The Fatigue Element

SIR,—The other day an obstetric colleague told me he was feeling quite exhausted after what had proved to be a gruelling morning "theatre." But it was an exceptional day, for he had had three emergencies the night before and had consequently spent little of the night in bed.

No doubt, had they occurred, the Courts would have attributed any operation deaths to the normal operative risks and not to fatigue in the operator. But can we as a profession continue to ignore the hazards inseparable from a system that is based upon the assumption that it is not morally irresponsible for a doctor to work 24 hours a day?—I am, etc.,

London, N.W.3. N. A. CHISHOLM.

First Catch Your Mite

SIR,—There are few diseases of which the causative agent is known, and fewer in which it can be simply shown in the consulting-room. Scabies is such a disease, and the demonstration of the *Sarcoptes scabiei* gives to the physician diagnostic satisfaction and to the patient determination to follow treatment.

Mellanby[1] clearly explained how to remove the mite from the skin, but it is surprising how often this technique has degenerated into blindly scratching and scraping with a scalpel at a likely burrow or papule. The secret of success is to find the mite in a burrow, usually on the hand, wrist, ankle, penis, or elbow. Burrows and mites may be detected more easily by rubbing the scaly lesions at these sites with soap and water on a gauze swab, thus removing dirt and making the scales translucent. The mite will then be seen by the naked eye as a minute black dot which can be removed on the point of a straight triangular surgical needle, as Mellanby described. From the needle, to which it conveniently adheres as a white dot, it may be transferred to a dry slide. If the slide is warmed the mite will move about, and can better be seen with a hand lens; a microscope is not essential. In recently treated cases it is usually possible to remove dead mites, but the microscope is necessary to distinguish them from keratin debris.—I am, etc.,

London, W.1. PETER A. J. SMITH.

REFERENCE

Mellanby, K. (1943). *Scabies*. London.

Coloured Immigrants

SIR,—Dr. E. H. Eason's letter (*Journal*, November 1, p. 1106) is likely to do even less than Dr. J. Tudor Hart's (*Journal*, October 18, p. 974) to solve racial problems. In confusion of thought, he speaks of "recognition of the differences, physical, mental, and cultural." Physical differences are, of course, recognized but, more important, must be understood; and their reason is too well known to the profession to need explanation. Mental and cultural differences have, primarily, nothing to do with race.

As a West Indian, born and educated in West Indies, I know that there may be *no* difference mentally and culturally between a Black man and a White; yet two Englishmen may be poles apart in these respects, if one be an Eastender and the other an Oxonian. It is surely a matter of education and environment. The recognition of the fact that mental and cultural differences need not accompany physical differences is the first step towards solving racial problems. It is non-recognition of this fact that causes some Whites to snub Negroes about whom they know nothing, save that they are of black skin. Racial pride is at its worst in what is the severest test of equality—marriage. At this point, racial feeling on both sides runs high, and pride and prejudice are falsely rationalized. One biological proof of species identity is the power to reproduce the species, and the geographical races of man are certainly of one species.—I am, etc.,

London, E.9. C. J. G. FRANKLIN.

Unmarried Parenthood

SIR,—Your leading article on unmarried parenthood (*Journal*, November 1, p. 1090) is welcome to a group of workers in Scotland who form the Scottish Council for the Unmarried Mother and her Child. There are certain matters on which, we urge, Scottish law and procedure are in special need of reform; for instance, in contrast to English practice, no provision is yet made for the official collection of aliment from the fathers of illegitimate children, or the exercise of legal pressure in case of default, without a new action which must normally be taken (and paid for) by the mother. Too often, moreover, in Scotland, the curator (or guardian) *ad litem* appointed by the court is a lawyer, often young and inexperienced in social matters, rather than an official or social worker with experience in child welfare.

On the other hand there are matters in which Scottish law has pointed the way to English reform, e.g., the legitimation of a child by the subsequent marriage of his parents. Scotland has always accepted the legitimacy of children of putative (or void) marriages, if conceived while even one of the parents was in good faith. This has been conceded in England under recent legislation in the case of certain voided marriages, but extends in Scotland, as in Canon Law and in may other parts of Christendom, to unions void on account of bigamy.

A change in law in this and other matters would, as you say, benefit both mother and child, and your article shows that efforts made towards such reforms will be encouraged by the medical profession.—I am, etc.,

Edinburgh, 2. DOROTHEA WALPOLE,
Chairman,
Scottish Council for the Unmarried Mother and her Child.

Museum of Surgical Antiquities

SIR,—In the "Hall of Fame" of the International College of Surgeons in Chicago, a museum of surgical antiquities is being built up. Other countries of the world have contributed magnificent collections of old instruments, paintings, etc. I should like to appeal to all medical men who have any example of old instruments, etc., for this museum. Suitable acknowledgment will be made on all articles contributed. At present we have little to represent this country, which has subscribed so much to the development of medicine and surgery.—I am, etc.,

20, Highfield Road, Edgbaston, Birmingham. JAMES F. BRAILSFORD.

R.M.B.F. Christmas Appeal

SIR,—I should like to remind your readers who have not yet responded to the president's appeal (*Journal*, October 11, p. 914) that it is our custom to distribute the gifts some days before Christmas.

I hope all who can will send their contributions, marked "Christmas Gifts," to the Secretary, Royal Medical Benevolent Fund, 1, Balliol House, Manor Fields, Putney, London, S.W.15, as soon as possible.—I am, etc.,

FRANK JULER,
Honorary Treasurer,
Royal Medical Benevolent Fund.

POINTS FROM LETTERS

Premonition of Death

Dr. N. PINES (London, N.W.11) writes: In my letter regarding premonition of death and Nostradamus (*Journal*, November 1, p. 1106), I made a mistake. In Monsieur Ruir's book the page is 57 and not 99. A fuller description in English is found in James Laver's book *Nostradamus* (Penguin Books, 1952, pp. 70–1).

Hazards of Sport

Dr. E. BRAUER (Spennymoor, Co. Durham) writes: Every sport has its hazards, and football is no exception. Some of the readers of the *Journal* will, however, be surprised to learn that in my practice I have seen more deaths amongst spectators than players. . . . Three were men in their sixties: two died from coronary thrombosis on the way home after watching the game, one developed a cerebral thrombosis during the game and died in the early hours of the following morning without regaining consciousness; and the fourth was a young man in his thirties who was suffering from mitral stenosis, and he collapsed and died in the gallery, while watching the game, from coronary thrombosis.

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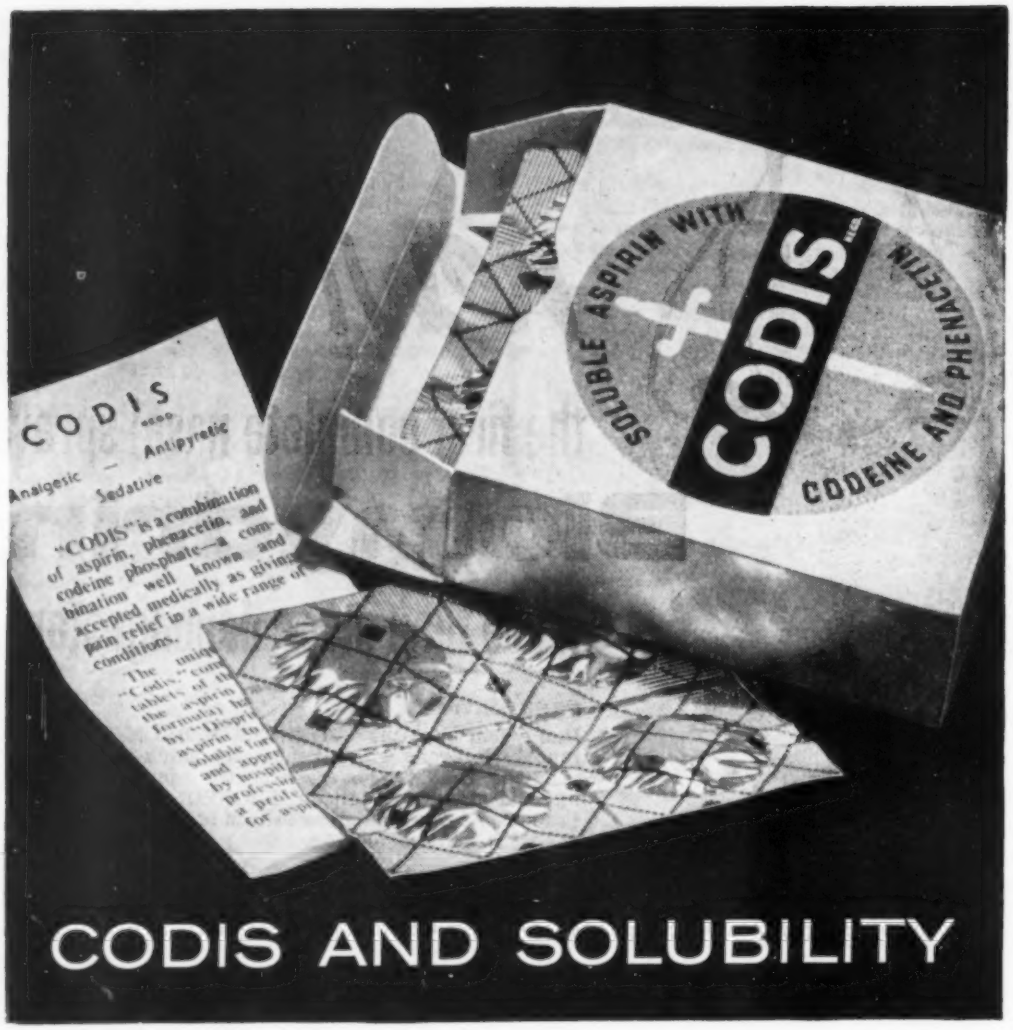
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Obituary

FRANK ATTHILL, M.R.C.S., L.R.C.P.

Dr. Frank Atthill, who was in practice at Great Bentley, Essex, died at his home there on September 27 at the age of 82.

Frank Atthill was born at St. Osyth, Essex, on November 25, 1875, the son of Dr. Robert Atthill. He was educated at Greenstead Green, Pocklington School, and Nuremberg, and studied medicine at Charing Cross Hospital, qualifying L.S.A. in 1898 and taking the M.R.C.S., L.R.C.P. in 1900. After qualification he went back to Essex to help his father in general practice. During the first world war he served in the R.A.M.C. in Salonika with the rank of captain, and was in command of a motor ambulance convoy. On his departure for Gallipoli his patients gave him a gold watch and surgical instruments: forty years later, on the occasion of his 80th birthday, they made him another presentation. During the second world war, when his partner was in the Forces, he carried on alone under extremely difficult conditions. In 1931 he married Miss Margery Mackenzie, daughter of the late Dr. W. J. Mackenzie, and she survives him.

J. W. writes: Dr. Frank Atthill was that rare figure—a legend in his lifetime. Many have been the tributes, private and public, paid to him: during his sixty years as a country doctor he became a unique personality and was greatly loved. He died in harness, as he would have wished, for his life was truly dedicated to his work. His obstetric skill was of a very high order, and his services were much sought after in the Tendring Hundred. His deep interest in all things medical was combined with an outstanding general knowledge—he would mend the patient's wireless, give him a dissertation on birds, or tell him what was wrong with his apples. He was a keen and excellent shot, and many stories are told of his prowess in this field. Fond of music, he had a fine tenor voice and played the piano well. "Dr. Frank," as he was called by his older patients, was a fine doctor of the old school, wise and gentle, and we shall not see his like again. Our deep sympathy goes out to his widow, who nursed him so devotedly in his last illness.

H. F. MACAULEY, M.Ch., F.R.C.S.I.

Mr. H. F. MacAuley, orthopaedic surgeon to the Mater Misericordiae Hospital, Dublin, died in Dublin on October 6. He was 64 years of age.

Henry Francis MacAuley was a medical student at the Queen's University of Belfast. He graduated M.B., B.Ch., with honours, in 1918, and then held an appointment at the Mater Infirmorum Hospital, Belfast. Elected to the Fellowship of the Royal College of Surgeons in Ireland in 1921, he proceeded to the M.Ch. in 1924, receiving a commendation, an infrequent addition to the diploma of which he was justly proud. From Belfast he moved to Dublin, where he joined the staffs of the Children's Hospital, to which, ultimately, he became consulting surgeon, and the Mater Misericordiae Hospital, to which he became orthopaedic surgeon. He was also consulting surgeon to Our Lady of Lourdes' Hospital, Dun Laoghaire. A member of the British Medical Association for nearly forty years, he was president of the Leinster Branch in 1927–8 and represented his Division at Annual Meetings around that time. When the Association held its Annual Meeting at Belfast in 1937 he served as a vice-president of the Section of Orthopaedics, and at the Annual Meeting at Dublin in 1952 he was a vice-president of the same Section.

W. D. writes: Harry MacAuley's passing was as sudden and unexpected as that of his elder brother, Charlie, two years ago, for each man was taken in the full tide of active work and accomplishment. They were two of a small band of northern men who had come to Dublin, there to rise to the top ranks among their surgical brethren. At the end of the first world war the Irish Sisters of Charity established an "open-air" hospital at Cappagh, on the outskirts of Dublin, for children crippled from tuberculosis. To this small hospital Harry MacAuley was appointed as surgeon-in-charge, and from that appointment he began his complete devotion to orthopaedic surgery as his life's work. From small beginnings the hospital has grown to its present stature as the largest orthopaedic hospital (260 beds) in Ireland; the demands on its accommodation led to the opening of an auxiliary hospital at Baldoyle (120 beds) under the same direction. To both institutions, and yet a third, at Coole, in Westmeath, as the senior member of their surgical staffs, he devoted his entire energy and enthusiasm. Work at these growing centres left him little time for recreation or writing, yet in the years between 1925 and 1935 he made various valuable contributions to the *Irish Journal of Medical Science* (the organ of the Royal Academy of Medicine in Ireland), the *British Journal of Surgery*, and the *British Medical Journal*.

To many, Harry MacAuley appeared as a shy, almost reticent personality, but among those who worked with him and knew him more intimately than I did he was a man beloved and trusted for his sense of loyalty and his complete integrity of soul and mind: these friends he had truly "grappled to his soul with hooks of steel." Despite thirty years of life in Dublin he never lost his northern "burr," with its hint of steel in his ready wit and gift of tongue. The most conscientious of workmen, he had little patience for slackness of mind or work in others. One could never mistake him for other than an Ulsterman: the glens of his native Antrim were dear to him, and to them he returned year after year, harking back to his homeland, still loyal to his natal soil, but abominating the politicians' border which he had to cross to reach it. As an early member of the British Orthopaedic Association, he had a wide acquaintance among his fellow specialists on the other side of the Irish Sea, many of whom will wish that we should tender their sympathy to the companion of his life's work with our own in her lonely sorrow.

Medico-Legal

THE PROFESSIONAL STATUTES

[FROM OUR LEGAL CORRESPONDENT]

Until 1956 the medical profession was regulated by a variety of statutes dating from the Tudors up to the Medical Act, 1950. On October 1, 1858, there came into force Statute 21 and 22 Victoriae cap. 90, "An Act to Regulate the Qualifications of Practitioners in Medicine and Surgery." This statute—the Medical Act, 1858—remained for nearly a hundred years the principal statute regulating the practice of medicine, and it applied to the whole United Kingdom. Certain earlier legislation then still in force was mainly of antiquarian interest.

Tudor Legislation

The preamble to Statute 32 Henrici 8 cap. 40, concerning Phisicians, recited that many "of the corporation of the comminaltie and felowship of the science and facultie of phisicke" in the city of London were compelled to keep watch and ward and chosen to the office of constable "to their greate fatigation and unquieting and to the p[er]jill of their patientes." Section 1 discharged them for the future from these duties, it is to be hoped to the satisfaction of some "lordis of the counsaile and many of the nobilitie of the realm," as well as many other of Henry's faithful and liege people whom they "had in cure." By Section 3 "anny of the said companny or felowiship of phisitions, being hable chosen and admitted by the said president and felishp of

phisicians" was entitled to "practise and exercise the said science of physick in all and every its membres and partes" including surgery, within the realm.

In 1542, however, the "companie and felowship of surgeons of London, mynding oonelie theyre owne lucres, and nothing the profite or ease of the diseased or patient," were stated to "have sued, troubled and vexed divers honest persones" who had been treating sufferers with herbs, although forbidden to do so by a statute of 1511 within the city of London and seven miles round. To put an end to this the Herbalists Act, 1542, gave herbalists *carte blanche* to "mynistre medicines outwarde" within the realm, observing that if admitted surgeons would "mynistre theyre coonning to sore people unrewarded there shoulde not so manaye rotte and perishe to deathe for lacke of helpe of surgerye as dailie doo."

Apothecaries and Anatomy Acts

After these Tudor legislative ventures the next surviving statute was the Apothecaries Act, 1815. This Act confirmed the charter granted by James I in the fifteenth year of his reign incorporating the "Master, Wardens, and Society of the Art and Mystery of Apothecaries of the City of London." The Act removed the Society's ancient power to enter the shops of apothecaries in and near London and to examine medicines and impose penalties. It took the first step towards the modern professional framework by requiring the Society to establish a court of examiners, and prohibiting anyone from practising as an apothecary without a certificate from the court. Intending practitioners were required to provide testimonials of sufficient medical education and good moral conduct, and to give notice to the clerk of the Society of their intention to practise. The Act did not extend to the conduct of the business of chemists or druggists, and was not, unless expressly, to trespass upon the rights, privileges, and immunities of the Universities of Oxford or Cambridge, the Royal Colleges, or the Society itself.

In 1832 there was passed the Anatomy Act, designed to regulate schools of anatomy and put the resurrectionists out of business. This was followed in 1858 by the Medical Act.

Medical Act, 1858

The Medical Act, 1858, followed a rather different pattern from that set by the Apothecaries Act 43 years before. The Act established "The General Council of Medical Education and Registration of the United Kingdom," referred to as the General Council, and provided for the formation of branch councils for England, Scotland, and Ireland. General and branch councils were to appoint registrars to keep registers of everyone possessing scheduled qualifications at the time of the passing of the Act and of all people thereafter qualified. Those without qualification who had been in practice before August 1, 1815, were also eligible for admission to the register. No one not on the register was to be entitled to recover in any court of law for any "medical or surgical advice, attendance, operation, or medicine which he had prescribed and supplied." Appointments in hospitals, institutions, ships, or services were to be available only to practitioners on the register. The unregistered practitioner was not forbidden; the design was calculated to squeeze him out.

The qualifications required for inclusion on the register were the fellowship, licentiate, or extra licentiate of the Royal College of Physicians of London; the fellowship, membership, or licentiate of the Royal College of Physicians of Edinburgh; the fellowship or licentiate of the King's and Queen's College of Physicians of Ireland; the fellowship or membership or licentiate in midwifery of the Royal College of Surgeons of England; the fellowship or licentiate of the Royal College of Surgeons of Edinburgh, the Faculty of Physicians and Surgeons of Edinburgh, the Faculty of Physicians and Surgeons of Glasgow, or of the Royal College of Surgeons in Ireland; the licentiate of the Society of Apothecaries, London, or of the Apothecaries Hall, Dublin; or the doctorate, bachelorate, licentiate in medicine, or mastery in surgery of any university in the United Kingdom, or doctorate of medicine granted before the passing of the Act by the Archbishop of Canterbury. Subject to conditions, doctors of medicine of foreign or colonial universities or colleges practising as physicians in the United Kingdom in 1858 might also be registered.

The General Council was to be informed by the qualifying bodies of their courses of study and examinations, and if the Council was dissatisfied with the standard of any body it could make representations to the Privy Council, which was empowered to suspend the right of registration arising from that body's qualification until its house was put in order. The General Council was also given important disciplinary power. It could at its discretion strike off the register any practitioner convicted of crime or adjudged after due inquiry to have been guilty of infamous conduct in any professional respect.

Amending Acts

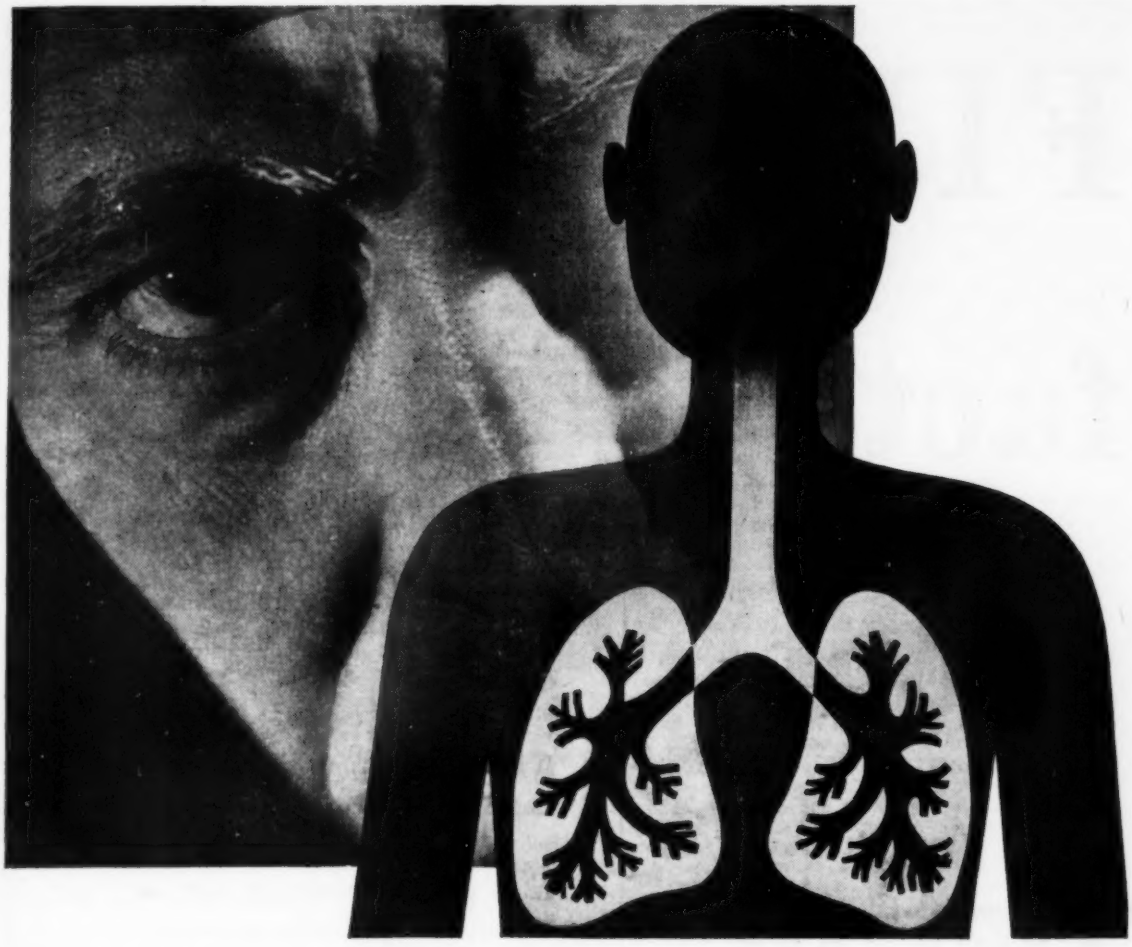
There were amending Acts passed between 1858 and 1886 affecting the incorporation of the General Council, the removal of sex disqualification on registration, the Royal Colleges, the Apothecaries, and other matters. The next major alteration was made by the Medical Act, 1886. This provided that no one was to be registered in future without passing a qualifying examination in medicine, surgery, and midwifery conducted by a university in the United Kingdom, or any medical corporation qualified to grant diplomas in medicine and surgery, or any combination of university and university or corporation qualified to cover all three fields. The examinations were to be under the supervision of inspectors appointed by the General Council whose duty it was to maintain the standard of proficiency required from candidates. The Council was empowered, where it thought the standard insufficient, to make representations to the Privy Council that the particular authority's right to hold qualifying examinations should be withdrawn.

The Act dealt with such additional matters as the membership of the Council and the election of its elected members and the registration of Commonwealth and foreign practitioners in certain circumstances. It also included an addition to the 1858 set-up which was a little reminiscent of the contrast between Henry VIII's statutes of 1540 and 1542. If the Privy Council at any time considered that the General Council had failed to secure the maintenance of a sufficient qualifying examination standard or fulfil any of its other duties, it might notify the General Council of its opinion. If the General Council failed to comply with any directions of the Privy Council relating to such notification the Privy Council could take action itself. Any two members of the Privy Council were empowered to do the deed.

Provisional Registration

The most recent additions to the statutory regulation of the profession were made by the Medical Act, 1950. In order to secure that before full registration practitioners should have had adequate practical experience it set up provisional registration, to be followed by full registration only upon a certificate that the practitioner has specified hospital experience. The Act also made various alterations in the constitution of the Council, and delegated its disciplinary functions to the Medical Disciplinary Committee, whose constitution and procedure were provided for. It allowed an appeal to the Privy Council from an order striking a practitioner off the register, and made provision for his restoration in certain circumstances. It provided for the appointment by the Council of visitors to medical schools. It also dealt with various minor matters.

Finally the Medical Act, 1956, was passed under the provisions of the Consolidation of Enactments (Procedure) Act, 1949, in order to rationalize the statutory tangle. It does not affect the substance of the previous statutes but repeals and replaces most of them, including those of the Tudors, so that the whole law is now to be found conveniently in the consolidating Act. There, for the time being, the matter rests.



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Medical Notes in Parliament

CHILDREN'S HOSPITALS

Lord BALFOUR OF BURLEIGH asked the Government on November 13 if it was their policy to act on the unanimous opinion of the Paediatric Committee of the Royal College of Physicians in relation to the care of children in hospital; and in particular to have regard to the view of the committee that "there is no doubt that special children's hospitals offer the best service for children, because the staff, at all levels and in all departments, is attuned to the special needs of the sick child."

The EARL OF ONSLOW, Captain, Yeomen of the Guard, stated that the Minister of Health fully recognized the merits of special children's hospitals, but did not consider that they should necessarily override all other considerations. He certainly did not rule out the use of children's units in general hospitals, as was also envisaged by the Paediatric Committee of the Royal College. The right form of provision in a particular area would depend on the circumstances of the area, and would be a matter for decision by the hospital board concerned in the first instance.

Lord BALFOUR OF BURLEIGH asked for some idea of what considerations would lead the Minister to override this unanimous recommendation of the most eminent members of the medical profession. The EARL OF ONSLOW said he thought the answer in general would be that in particular areas, where it was more suitable to have a children's ward in an existing hospital, that would be the case, and at the same time, of course, the staff looking after the children would be specially trained. One of the considerations the Minister would take into account would be visiting. Probably one of the most important things in the care of children was that the parents should be able to visit them whenever possible, and a small children's hospital in an area which might be accessible to the few but not the many would not really achieve what Lord Balfour wanted.

Viscount ELIBANK said this was the first time they had heard of this reason for having beds in a general hospital—so that the parents might visit. Was not the fact that children should be looked after by staff accustomed to doing that much more important than that parents should visit them? The EARL OF ONSLOW said he had tried to point out that the staff in those wards in a general hospital would be those who were trained to look after children.

HEALTH AND SAFETY IN FACTORIES

The House of Commons gave an agreed second reading on November 17 to the Factories Bill, which amends and adds to existing legislation. Among other proposals it gives the Minister of Labour the duty of promoting health, safety, and welfare in premises and operations to which the Factories Acts apply. It provides, as Mr. IAIN MACLEOD explained, for the first time a statutory basis for the voluntary activities; and by Clause 19 requires the Minister to promote safety, health, and welfare by the collection and dissemination of information and by carrying out and assisting investigations. There were repeated complaints, led by Mr. A. ROBENS (Blyth, Lab.), at the failure to bring in at least parts of the Gowers Report. Mr. R. CARR (Mitcham, Con.), who recently left the junior post at the Ministry of Labour, thought there could have been more incentive to improve first-aid work. Any factory of any size ought to have a separate first-aid room or surgery; boxes and trained workers, however good the system, were not enough. This point was taken up by Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.), who said there were first-aid boxes inadequately stocked, and often containing dirty and infectious dressings. They were both assured by Mr. MACLEOD that there was more behind the words used in the clause than appeared. It was intended to have discussions, and then to make an order to ensure that the standards would be fully equal to those laid down by such organizations as the St. John Ambulance Brigade.

Another point made by Dr. STROSS was that owners or occupiers of factories should notify the district inspector of any intention to use any form of radioactive substance. Mr. R. MASON (Barnsley, Lab.) supported him in this, arguing that there was insufficient control over the introduction of such substances into factory work and insufficient knowledge of their hidden dangers. Mr. RICHARD WOOD, the Parliamentary Secretary, explained that the Minister could take action to deal with radioactive hazards under section 60 of the 1937 Act.

QUESTIONS IN THE COMMONS

Chronic Sick on Doctors' Lists

Sir WILLIAM ROBSON-BROWN (Esher, Con.) asked the Minister of Health on November 13 whether chronically sick patients who were permanently resident in a hospital were still required to remain on the active list of their panel doctor. Mr. D. WALKER-SMITH stated that arrangements were made for the removal from the lists of general medical practitioners of the names of patients who had been in a mental or mental deficiency hospital for two years or more. The relatively small number of very long-stay chronic sick patients in other hospitals, while not required to remain on the lists, were at liberty to do so. It would be wrong to put pressure on them to leave their family doctors' lists, since this could be interpreted by them as implying that their condition was hopeless; nor had the responsibility of the family doctor necessarily ended in these cases.

Better Design for Children's Shoes

Mr. HARMAR NICHOLLS, Parliamentary Secretary, Ministry of Works, informed Mr. NORMAN COLE (South Bedfordshire, Lib. and Con.) on November 11 that the British Boot, Shoe, and Allied Trades Research Association, supported by the Department of Scientific and Industrial Research, had made foot measurements of many thousands of children, in conjunction with the health departments of certain local authorities. The data had been analysed, and as a result new and improved lasts for children's shoes had been designed by the Research Association.

Edinburgh University

Mr. J. RANKIN (Govan, Lab.) asked the Chancellor of the Exchequer whether, in view of the public appeal for £1m. which had been made by Edinburgh University, he would arrange for an additional grant to be made to the university from public funds. Mr. D. HEATHCOAT AMORY.—No, Sir, the University Grants Committee is responsible for the allocation among the universities of the funds made available by the Government for new university buildings.

Mr. RANKIN asked the Chancellor if he was aware that in the present session, owing to the lack of accommodation, Edinburgh University was unable to accept all the students who qualified for entry. Did he realize that a similar situation obtained in Glasgow and might well extend to the other two universities in Scotland, and did he consider this was the way in which to secure the technologists whom we said we needed? Would he look again at the whole question of the amount spent in university grants? Mr. AMORY said he realized and understood the pressure on almost all the universities to-day; but the programme of building for the next four years which the Government had approved was a substantially increased one. He believed it did full justice to the possibilities, bearing in mind that buildings were not the only issue which we had to face. When university buildings were extended, the number of staff had to be increased. Mr. HAROLD WILSON (Hoyton, Lab.) said that since the quinquennial grants were put into operation rising costs and other expenses had greatly frustrated the effects of the new grants, with a period of four years still to run. Was the Chancellor aware that many English as well as Scottish universities were seriously prejudiced, and would he look at the whole programme again to see whether it might be increased to take account of the effects of inflation? Mr. AMORY replied that the increase which had taken place in building costs since then hardly justified the term "greatly."

Radio-strontium Fall-out

Mr. F. ALLAUN (Salford, East, Lab.) asked the Prime Minister if he was aware that the Harwell report showing that strontium-90 in the bones of Welsh sheep had increased in one locality from 18 to 170 units between 1954 and 1956 was now two years out of date, and if he would state the further increase revealed there by later examination. Mr. HAROLD MACMILLAN informed him that a further report would be published shortly by the Atomic Energy Research Establishment, Harwell, giving the 1957 figures for radio-strontium in soil, herbage, animal bone, and milk samples from the United Kingdom. He understood that this would show that the increase of strontium-90 in the bones of Welsh sheep during 1957 was much less than the increase recorded between 1955 and 1956. The maximum levels were considerably below the minimum which would justify any concern from the point of view of human or animal health.

He also stated, in reply to Mr. H. HUGHES (Aberdeen, North, Lab.), that most of the fall-out deposited in this country came from the stratosphere, and could not be attributed to particular weapon tests. There was no evidence that the fall-out from recent tests in the Pacific would modify earlier conclusions that the general level of radiation from weapon tests was so far very small compared with other sources, both natural and man-made. No appreciable fall-out could reach this country by sea from the Pacific.

In reply to a question on November 13 from Mr. MALCOLM MACMILLAN (Western Isles, Lab.) about radioactivity in the Highlands and Islands the PRIME MINISTER said that no doubt he was referring to a recent report on the radioactivity in the antlers of deer; the small quantity of radioactivity stated to be in these antlers was not unexpected in view of measures of radioactivity in the bones of animals from hill areas already reported. He had at present no evidence of the existence of any special hazard in the Highlands and Islands.

Industrial Health Service

Dr. BARNETT STROSS (Stoke-on-Trent, Central, Lab.) asked the Minister of Labour whether he would state as fully as possible his plans for the creation and extension of an occupational health service. Mr. RICHARD WOOD, Parliamentary Secretary, replied that the Industrial Health Advisory Committee advised the Minister on measures for the development of industrial health services in workplaces covered by the Factories Acts, and he was at present in consultation with the committee on these matters in the light of the results of the Halifax and Potteries surveys and of the practical experiments being carried on at the present time.

Factory Accidents

Mr. R. PRENTICE (East Ham, North, Lab.) asked the Minister of Labour on November 12 whether the favourable trend in the reduction of accidents, described in the annual report of the Chief Inspector of Factories for the year 1957, had been continued into 1958; and whether he would indicate the percentage of improvement. Mr. RICHARD WOOD recalled that this year, for the first time, accident statistics had been published at quarterly intervals in the Ministry of Labour *Gazette*. Those for the first quarter were published in May, and for the second quarter in August; those for the third quarter would be published in November. These were all provisional figures, he pointed out, subject to correction at the end of the year. It was necessary to take account of several factors in drawing deductions from accident statistics, and it was desirable to await the considered conclusions on the statistics for the year as a whole to be published in the annual report of the Chief Inspector of Factories. This year the report was published much earlier than in previous years, and he hoped to achieve a still earlier publication date next year.

Inquiry Into Drunkenness

Mr. J. SIMMONS (Brierley Hill, Lab.) asked the Home Secretary on November 13 to state the nature and personnel of the committee of inquiry which he had promised to institute with reference to the increase in youthful delinquency and drunkenness. Mr. R. A. BUTLER stated that he was arranging for the Social Survey Division of the Central Office of Information to carry out an investigation among police forces in selected areas into the continuing increase in the number of offences of drunkenness and to make a report to him. The investigation would cover all age groups, and not only offences by young persons.

Immigration Figures

Mr. ERNEST DAVIES (Enfield, East, Lab.) asked the Home Secretary for the estimated net movement of immigrants into the United Kingdom from India, Pakistan, and the Caribbean countries, respectively, during 1958 to the latest date available. Mr. BUTLER said the net inward movement for the ten months ended October 31, 1958, was roughly estimated to have been as follows: India, 6,000; Pakistan, 4,700; Caribbean countries 14,300.

Smoking as Cause of Death

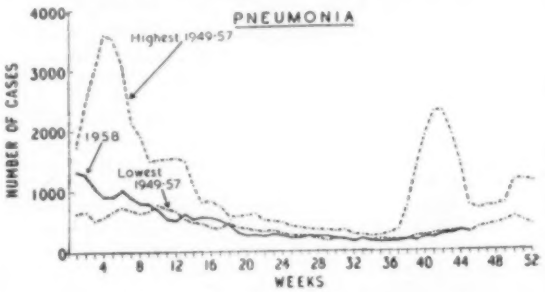
Mr. LLYWELYN WILLIAMS (Abertillery, Lab.) on November 17 asked the Minister of Health if he would make a statement on the certification recently made by a medical practitioner to the effect that death was caused by lung cancer as a result of heavy smoking. Mr. R. THOMPSON, Parliamentary Secretary, stated that a medical practitioner signing a death certificate must state to the best of his knowledge and belief the cause of death. This statement was entirely a matter for him.

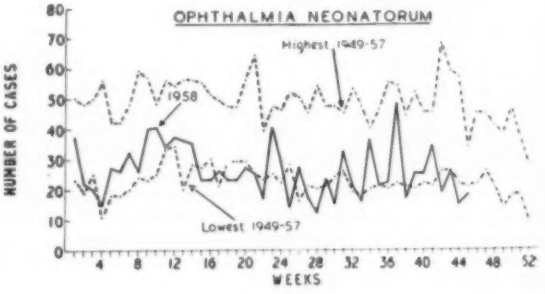
Mr. Thompson stated in another reply that the provisional figure for the number of deaths caused by lung cancer in the first six months of this year was 9,657.

Vital Statistics

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1949–57 are shown thus - - - - -, the figures for 1958 thus ———. Except for the curves showing notifications in 1958, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.





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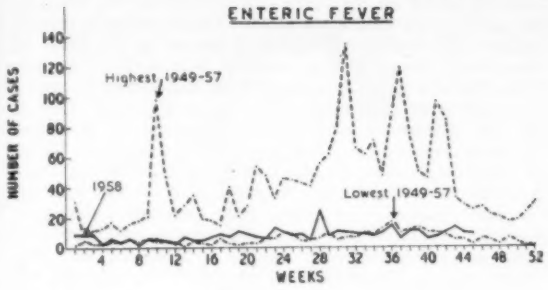

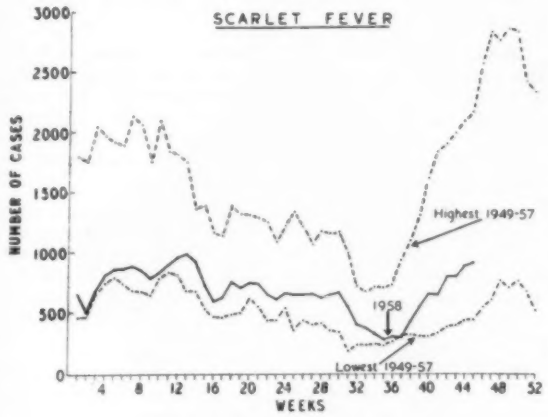

Week Ending November 8

The largest fluctuations in the notifications of infectious diseases in England and Wales during the week ending November 8 were rises of 301 for measles, from 5,014 to 5,315, 187 for food-poisoning, from 205 to 392, and 75 for dysentery, from 551 to 626.

The largest rises in the notifications of measles were 75 in Yorkshire West Riding, from 616 to 691 (Halifax C.B. 191), 57 in Yorkshire East Riding, from 301 to 358 (Kingston-upon-Hull C.B. 317), and 54 in Derbyshire, from 110 to 164 (Ashbourne U.D. 66); the largest falls were 58 in Middlesex, from 282 to 224, and 50 in Staffordshire, from 206 to 156. The notifications of whooping-cough numbered 643, being 6 more than in the preceding week; the largest fluctuations in trend during the week were a rise of 39 in Durham, from 38 to 77, and a fall of 28 in Suffolk, from 35 to 7. 912 cases of scarlet fever were notified, 23 more than in the preceding week, and the only variation in trend of any size was a rise of 22 in Yorkshire West Riding, from 105 to 127. 6 cases of diphtheria were notified, being the same number as in the preceding week. 2 of these cases were notified in London.

The notifications of acute poliomyelitis numbered 82 and were 5 more for paralytic and 2 fewer for non-paralytic cases than in the preceding week. The largest returns were Lancashire 17 (Manchester C.B. 9, Preston C.B. 2, Irlam U.D. 2); Yorkshire West Riding 10 (Leeds C.B. 4, Dewsbury C.B. 2); London 8 (Shoreditch 3, Wandsworth 3); Kent 8 (Chislehurst and Sidcup U.D. 4); Bedfordshire 6 (Bedford R.D. 2).

The chief centres of dysentery were Yorkshire West Riding 103 (Leeds C.B. 54, Dearne U.D. 10), Lancashire 80 (Eccles M.B. 29, Liverpool C.B. 26), London 72 (Wandsworth 22, Deptford 16); Warwickshire 69 (Coventry C.B. 59), Glamorganshire 42 (Cardiff R.D. 14, Barry M.B. 12), Yorkshire East Riding 37 (Kingston-upon Hull C.B. 23), Nottinghamshire 26, Northumberland 24 (Newcastle upon Tyne C.B. 19), and Middlesex 21.

The large rise in the number of notifications of food-poisoning was due to an outbreak involving 173 persons in Poole M.B., Dorset.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending November 1 (No. 44) and corresponding week 1957.

Figures of *cases* are for the countries shown and London administrative county. Figures of *deaths* and *births* are for the whole of England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES	1958 Eng. & Wales	1958 Lond.	1958 Scot.	1958 N. Ire.	1958 Eire	1957 Eng. & Wales	1957 Lond.	1957 Scot.	1957 N. Ire.	1957 Eire
Diphtheria	6	3	5	0	3	5	0	1	0	1
Dysentery	551	46	154	3	9	282	32	79	2	1
Encephalitis, acute	2	0		0		6	0		1	
Enteric fever:										
Typhoid	4	1	1	1		3	1	0	0	
Paratyphoid	5	0	2(B)	0		8	1	0	0	
Food-poisoning	205	15	9	0		174	17	16	2	
Infective enteritis or diarrhoea under 2 years				5	38				9	21
Measles*	5,014	300	60	25	210	1,736	23	18	13	39
Meningococcal infection	17	1	6	2		31	1	3	1	2
Ophthalmia neonatorum	15	2	5	0		22	0	4	0	
Pneumonia†	316	23	144	1		1,443	119	428	23	85
Poliomyelitis, acute:										
Paralytic	54	4	19	1	8	53	1	2	6	3
Non-paralytic	25	1				7	0			
Puerperal fever§	237	34	11	0		285	44	11	2	
Scarlet fever	889	66	128	19	41	444	40	66	19	14
Tuberculosis:										
Respiratory	502	51	104	21		541	82	108	22	
Non-respiratory	56	8	18	1		73	6	5	1	
Whooping-cough	637	21	64	54	69	401	9	28	0	4

DEATHS	1958 Eng. & Wales	1958 Lond.	1958 Scot.	1958 N. Ire.	1958 Eire	1957 Eng. & Wales	1957 Lond.	1957 Scot.	1957 N. Ire.	1957 Eire
Diphtheria	1	1	0	0	0	No comparable figures available.	0	0	0	0
Dysentery	0	0		0			0		0	0
Encephalitis, acute		0			0		0			0
Enteric fever	0	0	0	0			1	0	0	0
Infective enteritis or diarrhoea under 2 years	6	0	0	0	1		0	0	1	0
Influenza	8	1	1	0	1		37	20	8	17
Measles		0	0	0	0		0	0	0	0
Meningococcal infection		0	0				0	1		0
Pneumonia	393	27	16	1	3		62	22	18	12
Poliomyelitis, acute	4	1		0	0		0		0	0
Scarlet fever		0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory	67	5	10	0	1		11	9	0	2
Non-respiratory		1	0	0	1		0	0	2	1
Whooping-cough	2	0	0	1	0		0	0	0	0
Deaths 0–1 year	281	28	21	6	20		21	22	7	11
Deaths (excluding stillbirths)	8,982	722	496	107	134		823	601	135	180
LIVE BIRTHS	13,484	1199	934	200	361		1026	996	210	321
STILLBIRTHS	296	42	17				20	29		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
§ Includes puerperal pyrexia.

Medical News

B.M.A. Clinical Meeting.—The final programme of the Association's first Annual Clinical Meeting, which is being held at Southampton from December 4 to 7, will be found at p. 213 of the *Supplement*. Those wishing to attend the meeting should register without delay.

B.M.S.A. Dinner.—The British Medical Students' Association held a most successful dinner in the library of the London Hospital Medical College on November 14. It was attended by some 150 students from all parts of the United Kingdom; the speeches, though numerous, gained universal acclaim as models of brevity and wit; and distinction was added to the occasion by the presence, among the guests, of Sir HAROLD GILLETT, the new Lord Mayor of London, Dr. S. WAND, chairman of Council of the B.M.A., and Dr. H. B. MAY, dean of the Medical College, as well as delegates from medical student organizations abroad. Mr. MICHAEL HALL, editor of the *British Medical Students' Journal*, deputized for the president, Dr. P. G. WOOD, as chairman of the dinner. After his investiture as honorary president of the B.M.S.A., Mr. A. M. A. MOORE briefly reviewed the association's history and work; the latter included its report on preclinical education, with another on clinical education to follow; its arrangements for travel abroad; and the publication of its journal. Mr. HALL said that this year the B.M.S.A. was chairman nation of the International Federation of Medical Student Associations. The other speakers were Mr. J. W. SCOTT ANGUS, the grants and welfare officer, and Mr. MILES IRVING and Mr. COLIN G. BARNES, chairman of the Northern and London Regions respectively. Dr. BYRON EVANS replied for the guests. After the dinner there was a smoking concert.

Chair of Dermatology at Durham.—Dr. J. T. INGRAM, lecturer in diseases of the skin at Leeds University and physician in charge of the dermatological department at Leeds General Infirmary, has been appointed to a newly established chair of dermatology at Durham University. This is the first full-time chair of dermatology in Britain—there is a part-time chair at Edinburgh. Dr. Ingram qualified in medicine from the London Hospital in 1923, proceeding M.D.(London) and M.R.C.P. three years later. He was elected F.R.C.P. in 1936. In 1954 he was appointed Watson-Smith lecturer of the Royal College of Physicians of London. Apart from his war service as a consultant dermatologist in the Army, Dr. Ingram has spent most of his working life at Leeds. He expects to take up his new appointment in March.

Chair of Paediatrics, Makerere College.—Further details are now available about the new chair of paediatrics at Makerere College (University College of East Africa), of which Dr. D. B. JELLIFFE was recently appointed the first occupant (*Journal*, October 25, p. 1053). The creation of the chair now was made possible by a grant of $45,000 from the United Nations Children's Fund; it had been planned originally to establish the chair during the quinquennium 1961–6. The holder of the chair will be a full-time member of the University College staff and will be physician in charge of the children's wards and clinics at Mulago Hospital. It will be his task to develop the children's department as a centre of teaching and research in paediatrics and child health, and to promote public interest in problems of child care. It is hoped also to develop postgraduate medical training in paediatrics.

Clement Price Thomas Award.—Sir STANFORD CADE announced at the annual dinner last week of the Westminster Hospital and Medical School that 1,000 guineas had been subscribed from the Westminster group of hospitals to endow at the Royal College of Surgeons a prize to be known as the Clement Price Thomas award. The diners received the announcement with acclamation. In proposing the toast of Sir Clement Price Thomas, Sir Stanford dwelt on the many distinctions he has attained, and added, "He raised the already high prestige of British surgery still higher." Earlier, in proposing the toast of Westminster Hospital and Medical School, Sir CLEMENT PRICE THOMAS spoke to a sympathetic audience of his imminent retirement after nearly 40 years on the staff. One of the prerequisites for a good medical school, he said, was that better service should be given to patients than would be expected outside. Many centrally placed hospitals were divorced from the centres of population; unless teaching hospitals could give something extra, patients would go to hospitals nearer their homes. They had a staff second to none at the Westminster, and he emphasized that they should advance knowledge by research. He believed the next five years might determine the course of the next 50 years.

Royal Medal.—With the approval of THE QUEEN and on the recommendation of the council of the Royal Society, Professor A. L. HODGKIN, F.R.S., of Cambridge, has been awarded one of this year's two Royal medals. Professor Hodgkin is the Royal Society research professor, and the award is for his distinguished work on the mechanism of excitation and conduction in nerve and muscle.

Royal Society of Edinburgh.—The following medical men were among those elected to office for the 1958–9 session at a meeting of the Royal Society of Edinburgh on October 27: Professor J. N. DAVIDSON as president; Professor D. WHITTERIDGE as vice-president; Dr. D. GUTHRIE as curator of the library and museum; and Professor G. M. WYBURN and Professor A. E. RITCHIE as councillors.

Royal College of Surgeons.—The John Hunter medal was presented to Dr. L. W. PROGER, pathology curator of the College's museum, at a meeting of the council on November 13, with the president, Sir JAMES PATERSON ROSS, in the chair. Sir CLEMENT PRICE THOMAS was appointed Tudor Edwards memorial lecturer, and Mr. MICHAEL SMYTH as Gordon-Watson lecturer, both for 1958. Sir CECIL WAKELEY's election as a trustee of the Hunterian Collection was announced. The Begley prize was awarded to Miss M. E. ASHWORTH, of Charing Cross Hospital Medical School.

Drummond Fellowship.—Applications are invited for a Drummond fellowship for research in nutrition. Depending on the fellow's qualifications, the fellowship may be a senior (£1,000 a year) or a junior one (£500 a year), and it is usually tenable for two years. The election will be in March. Full particulars are obtainable from the hon. secretary, Drummond Trust, University College London, Gower Street, London, W.C.1. The closing date for applications is January 31.

Eli Lilly Travelling Fellowship.—Applications are invited from qualified practitioners who are nationals of the Republic of Ireland for one Eli Lilly travelling fellowship tenable in the United States for one year, commencing September, 1959. Application forms and full particulars may be obtained from the Secretary, Medical Research Council of Ireland, 50, Merrion Square, Dublin. The closing date is April 30, 1959.

Q.H.S.—Air Commodore G. H. MORLEY has been appointed an Honorary Surgeon to the Queen.

Dr. W. R. Keatinge has been elected to a fellowship at Pembroke College, Cambridge.

COMING EVENTS

Royal College of Physicians.—Details are given in the advertisements (p. 56) of a conference on "Clinical Effects of Electrolyte Disturbances," which the Royal College of Physicians of London is holding on February 27 and 28. The conference is intended primarily for fellows and members of the College, the entrance fee is five guineas, and the closing date for applications is January 23.

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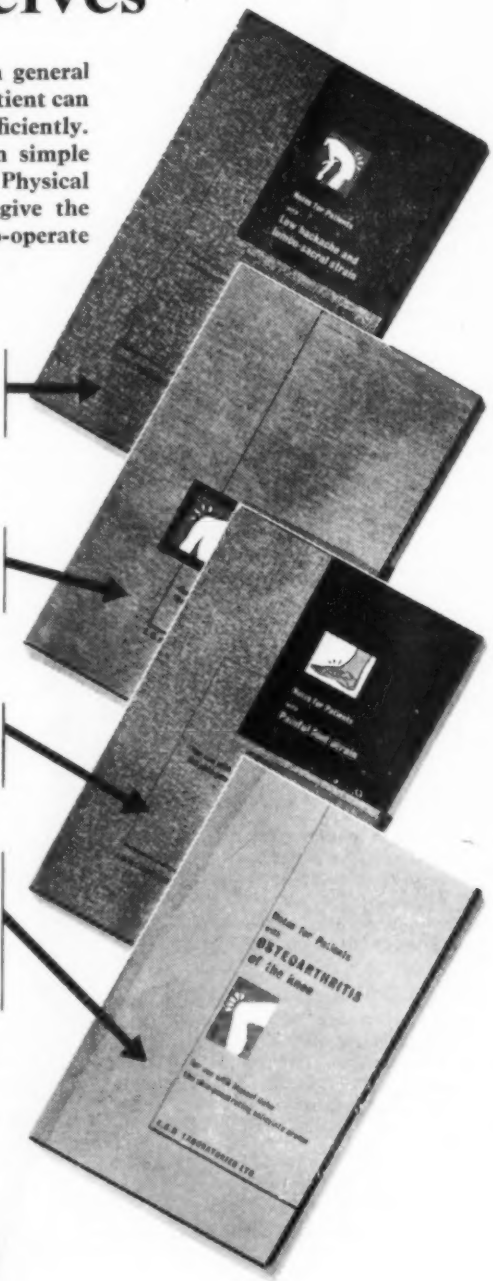
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Hints for Patients with
Painful foot strain
Hints for Patients with
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NEW ISSUES

British Journal of Ophthalmology.—Issued monthly (£6 annually). The new issue (Vol. 42, No. 11) includes:

STERILE DROPS AND LOTIONS IN OPHTHALMIC PRACTICE. F. Ridley.
CONGENITAL ARTERIO-VENOUS ANEURYSM OF THE RETINA. M. E. Cameron.
STUDIES ON THE CORNEAL AND TRABECULAR ENDOTHELIUM. II. THE ENDOTHELIUM OF THE ZONE OF TRANSITION. F. Vrabec.
SECOND SEASON PREDNISONE TREATMENT IN VERNAL CONJUNCTIVITIS WITH SPECIAL REFERENCE TO CORNEAL COMPLICATIONS. E. Neumann.
CHANGES IN OCULAR RIGIDITY IN ENDOCRINE EXOPHTHALMOS. R. Weekers and G. Lavergne.
DIABETIC RETINOPATHY AND CYANOCOBALAMIN (VITAMIN B_{12}). A. J. Cameron and G. J. Ahern.
HEREDITARY CILIARY AND SUPERCILIARY HYPOTRICHOSIS. A. Urrets-Zavalia and E. S. Jimenez.
SCLEROSING LIPO-GRANULOMA IN THE ORBIT. G. B. Davies and P. L. Wong.
MACULAR LESION AFTER INFLUENZA. S. P. Mathur.

Abstracts of World Medicine.—Issued in the first week of each month, this journal contains abstracts of important papers selected from the current medical literature of the world. Annual subscription £4 4s.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, November 24

GUY'S HOSPITAL.—At Anatomy Lecture Theatre, 5.15 p.m., lecture-demonstration in endocrinology by Dr. P. M. F. Bishop: Cushing's Syndrome.
●INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Queen Charlotte's Hospital, 4.30 p.m., Guest Lecture by Mr. S. D. Loxton: Post-partum Haemorrhage.
MANCHESTER MEDICAL SOCIETY.—(1) SECTION OF ODONTOLOGY: At Lecture Room, Dental Hospital, 4.30 for 5 p.m., Dr. J. H. Scott: Art and Science of Research. (2) SECTION OF GENERAL PRACTICE: At Large Anatomy Theatre, Manchester University, 8.30 for 9 p.m., Dr. F. Janus: Differential Diagnosis and Treatment of Glaucoma.

Tuesday, November 25

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. E. H. Mercer: Electron Microscopy and the Structure of the Living Cell.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. E. J. Moynahan: Pigmentation.
●INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Hammersmith Hospital, 3 p.m., Guest Lecture by Mr. Leslie Williams: Obstetrician's Attitude to Radiology.
LONDON UNIVERSITY.—At Great Hall, Queen Mary College, 1.30 p.m., Professor J. L. D'Silva: Modern Medicine—Science or Art?
PLYMOUTH MEDICAL SOCIETY.—At Freedom Fields, 8.30 p.m., "The National Ill-health Service." A discussion meeting on Hospital and General Practice in Relation to the Community. Introduced by Dr. Robert Blair, Mr. L. Walrond Innes, and Dr. J. Nixon Morris.
QUAKER MEDICAL SOCIETY.—At Small Meeting House, Friends House, 8 p.m., Lister Lecture by Mr. Basil Hume: Their Lives are in Our Hands.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Theatre, 5 p.m., Mr. W. R. Winterton: Gynaecology of Old Age.
WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Mr. G. C. Knight: Surgical Treatment of Mental Illness.

Wednesday, November 26

BRITISH PSYCHOLOGICAL SOCIETY: MEDICAL SECTION.—At Royal Society of Medicine, 8.30 p.m., Dr. John Bowlby: Studies of Parent-Infant Interaction in Man and Animals: Some Notes on Projects in Progress.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Control of Fungous Diseases.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. N. Lloyd Rusby: Lung Manifestations of the Collagen Disorders.
●INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Chelsea Hospital for Women, 4.30 p.m., Guest Lecture by Mr. A. Brews: Developmental Anomalies of the Female Genital Tract and their Clinical Significance.
INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. A. R. C. Higham: Enuresis.
MANCHESTER MEDICAL SOCIETY: SECTION OF PATHOLOGY.—At Large Anatomy Theatre, Manchester University, 4.30 for 5 p.m., Professor H. G. Cannon: Lamarck—Fact and Fancy.
●NATIONAL COLLEGE OF RUBBER TECHNOLOGY, Northern Polytechnic, Holloway Road, N.—6.30 p.m., Mr. D. E. Seymour: Use of Rubber and Plastics in Surgical Dressings.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Guest Lecture by Dr. H. M. Sinclair: Essential Fatty Acids.
ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Finlayson Lecture by Sir Russell Brain, Bt.: Neurology of the Cervical Spine.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Dr. Eric W. Gibbs: Some Aspects of Food Hygiene in Retail Shops. (Illustrated.)

Thursday, November 27

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Mr. Michael Abercrombie, F.R.S.: Cell Surface and the Control of Growth.
HONYMAN GILLESPIE LECTURES.—At Anatomy Theatre, University New Buildings, Teviot Place, Edinburgh, 5 p.m., Dr. Ian Gordon: Rheumatic Syndromes in the Elderly.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. H. Marten: Dermal Allergy.
LIVERPOOL MEDICAL INSTITUTION.—At David Lewis Northern Hospital, 2.30 p.m., clinical demonstration.
LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Medical Society of London, 8.15 p.m., Dr. Sheila Sherlock: Advances in the Treatment of Diseases of the Liver.
ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.—At Victoria Infirmary, 8.30 p.m., joint meeting with Southern Medical Society.
ROYAL NORTHERN HOSPITAL.—2.45 p.m., Mr. W. B. Gabriel: Diagnosis and Treatment of Some Common Rectal Diseases.
ST. ANDREWS UNIVERSITY.—At Physiology Department Lecture Theatre, 5 p.m., Professor L. S. Penrose, F.R.S.: Mutation and Selection in Man.
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF BIOCHEMISTRY.—At Physiology Theatre, Gower Street, W.C., 5 p.m., Dr. E. M. Shooter: Configuration of Proteins in Solution.

Friday, November 28

BRITISH TUBERCULOSIS ASSOCIATION.—At 26, Portland Place, W., 5 p.m., Symposium: Role of Bronchography in the Early Diagnosis of Lung Cancer. Papers by Dr. Lynne Reid, Dr. V. G. Peckar, Dr. Brian Shaw, and Mr. A. Blesovsky. Discussion will be opened by Mr. Cyril James.
●INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. M. B. MacKenna: clinical demonstration.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Mr. J. W. S. Lindahl: clinical demonstration.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—10 a.m., Guest Lecture by Mr. F. R. Kilpatrick: Partial Nephrectomy.
ROYAL ANTHROPOLOGICAL INSTITUTE.—At Royal Society, Burlington House, Huxley Memorial Lecture by Sir Wilfrid le Gros Clark, F.R.S.: Bones of Contention. (Illustrated by slides.)

Sunday, November 30

MANCHESTER UNIVERSITY: FACULTY OF MEDICINE AND NORTH-WEST ENGLAND FACULTY, COLLEGE OF GENERAL PRACTITIONERS.—At Theatre 1, Clinical Sciences Building, York Place, 11 a.m., Dr. A. Morgan Jones: Early Diagnosis of Cardiac Insufficiency.

APPOINTMENTS

NORTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD.—Josephine J. Candy, M.B., B.Ch., F.F.A. R.C.S., Consultant Anaesthetist, King Edward Memorial Hospital, Perivale Maternity Hospital, Brentford Hospital, Acton Hospital, and Southall-Norwood Hospital; E. H. Larkin, M.B., B.S., M.R.C.P., D.P.M., Consultant Psychiatrist, Halliwick Hospital; Ismond Rosen, M.D., D.P.M., Consultant Psychiatrist, British Hospital for Functional Nervous Disorders; V. Edmunds, M.D., M.R.C.P., Consultant Physician, Mount Vernon Hospital; Hilda M. S. Davidson, M.B., B.S., D.P.M., Consultant Psychiatrist and Medical Director, Child Guidance Training Centre, Osnaburgh Street, N.W.1; J. Luder, M.D., M.R.C.P., D.C.H., Consultant Paediatrician, Royal Northern Hospital; G. B. Rooke, B.M., B.Ch., Assistant Chest Physician (S.H.M.O.), Ashford Chest Clinic; R. E. Molloy, M.B., B.S., F.F.A. R.C.S., Consultant Anaesthetist, Whittington Hospital; R. H. Gosling, M.D., D.P.M., Consultant Psychiatrist (Psychotherapy), Tavistock Clinic; E. J. D'Arcy, F.F.A. R.C.S., M.R.C.S., L.R.C.P., Consultant Anaesthetist, Maidenhead Hospital, Canadian Red Cross Memorial Hospital, Upton Hospital.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—B. W. Webb, M.D., M.R.C.P., D.C.H., Consultant Paediatrician in South Somerset Clinical Area; D. H. Isaac, M.D., M.R.C.P., Consultant Physician-Geriatrician in South Somerset Clinical Area; N. Slade, M.B., Ch.B., F.R.C.S., Consultant Genito-Urinary Surgeon to Bristol Clinical Area; T. F. McCarthy, M.D., M.R.C.P.Ed., Assistant Geriatrician in North Gloucestershire Clinical Area; A. M. N. Gardner, B.M., B.Ch., F.R.C.S., Consultant Surgeon in Exeter Clinical Area; D. D. Ellis, M.B., B.Ch., D.P.M., Consultant Psychiatrist at St. Lawrence's Hospital, Bodmin; H. M. Walker, M.B., B.S., Registrar in Obstetrics and Gynaecology at Royal Devon and Exeter Hospital, Exeter; G. A. Hanks, M.B., Ch.B., D.Obst.R.C.O.G., Surgical Registrar of Weston-super-Mare General Hospital.

TYSER, P. A., M.D., D.P.H., County Medical Officer and Principal School Medical Officer, Cambridgeshire County Council (as from March 1, 1959).

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Atherton.—On November 4, 1958, at Hardwick Hall Maternity Hospital, Sedgefield, Co. Durham, to Anne (formerly Watkin-Jones), wife of William Atherton, M.B., B.Chir., of "Jesmond House," Sedgefield General Hospital, Sedgefield, a daughter—Eluned Jane.
Hughes.—On November 2, 1958, at Brighton, Sussex, to Pamela (formerly Canham), M.B., B.S., D.T.M.&H., wife of I. G. Hughes, Geological Survey, Ghana, a sister for Peter.
Todd.—On October 31, 1958, at 6, Pennine Drive, London, N.W., to Drs. K. R. and Olive Todd (formerly Gray), a son—Stephen Charles.
Watson.—On November 15, 1958, at Milverton, Somerset, to Audrey, wife of Dr. David L. Watson, a second son—Peter Geoffrey.
Watts.—On November 1, 1958, to Shelagh (formerly Wimhurst), M.B., B.S., F.F.A.R.C.S., and K. Dawson Watts, F.D.S., of 22, Gordon Road, Ealing, London, W., a daughter—Susan Nicola.

DEATHS

Boyall.—On November 1, 1958, at the Minehead and West Somerset Hospital, Arthur Vincent Boyall, M.R.C.S., L.R.C.P., aged 71.
Byrne.—On October 27, 1958, in London, John Edward Byrne, M.B., B.S., M.R.A.C.P., of 32, Rodney Court, Maida Vale, London, W., formerly of Melbourne, Australia.
Campbell.—On October 25, 1958, in Bristol, James Fraser Muir Campbell, M.B., Ch.B., Surgeon Captain, R.N. (retired).
Cox.—On October 31, 1958, in hospital, John Edmund Cox, L.R.C.P.& S.Ed., L.R.F.P.S., of West Mersea, Essex, aged 80.
Cruden.—On October 31, 1958, at 80, The Droveway, Hove, Sussex, William Victor Cruden, M.B., B.S.
Henderson.—On October 27, 1958, at his home, William John Gilmour Henderson, M.B., Ch.B., D.P.H., of 8, Cammo Gardens, Barnton, Edinburgh, and 9, Brunton Place, Edinburgh.
Lea.—On October 27, 1958, at his home, 4, Brunel House, 105, Cheyne Walk, London, S.W., Edmund Thomas Howard Lea, M.R.C.S., L.R.C.P., D.P.H.
McConkey.—On October 26, 1958, at his home, Springhill, Bishopsteignton, Devon, John Travers McConkey, C.B.E., L.R.C.P.&S.I. & L.M., Brigadier, late R.A.M.C. (retired), aged 68.
Shaw.—On October 29, 1958, Archibald Campbell Shaw, M.B., Ch.B., Surgeon Captain, R.N. (retired).
Sloan.—On October 26, 1958, at Biggar, Lanarkshire, Alexander Bankier Sloan, T.D., M.D.
Urquhart.—On October 26, 1958, at Wayside Cottage, Fleet, Hants, Alexander Urquhart, M.D., D.P.H., late of Shepperton, Middx, aged 86.

Any Questions ?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Hodgkin's Disease

Q.—*Has there been any recent progress in the treatment of Hodgkin's disease? What is the mortality rate following the removal of the spleen?*

A.—There are no major improvements in the treatment of Hodgkin's disease. Early cases with localized masses are treated by *x*-irradiation. Generalized cases are usually best treated systemically with one of the alkylating agents such as mustine, tretamine, or nitromin. Actinomycin C was reported to improve some cases, but does not seem to be preferable to the alkylating agents. Cortisone or prednisone is commonly given in addition to generalized cases when the peripheral red cell count is falling, and temporary benefit can sometimes be obtained. The cause of the terminal anaemia in Hodgkin's disease is uncertain—splenectomy has been recommended on the hypothesis that hypersplenism was responsible. Even when haemolytic anaemia can be shown to be present splenectomy is not necessarily beneficial.[1] Sykes *et al.*[2] reviewed 30 cases of Hodgkin's disease treated by splenectomy, and added 7 more cases without enthusiasm. There is no evidence that the disease is thereby arrested. In the advanced case there is a temporary improvement in thrombopenia and leucopenia, and the intervals between transfusions may sometimes be slightly lengthened. The mortality from the operation is very low. Williams *et al.*[3] reported 11 cases of splenectomy in Hodgkin's disease. There was no operative mortality. In spite of this, the procedure does not seem to be a worth-while procedure in Hodgkin's disease.

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1 Nelson, M. G., *Irish J. med. Sci.*, 1956, 6s., 427.
2 Sykes, M. P., Karnofsky, D. A., McNeer, G. P., and Craver, L. F., *Blood*, 1954, **9**, 824.
3 Williams, R. D., Andrews, N. C., and Zanes, R. P., *Surg. Gynec. Obstet.*, 1951, **93**, 636.

Side-effects of Amyl Nitrite

Q.—*Is repeated inhalation of amyl nitrite, or its improper use as an ingredient in cocktails, likely to be harmful or habit-forming?*

A.—Amyl nitrite is effective therapeutically only when inhaled. When taken orally it is destroyed in the alimentary canal, and it is improbable that its use as an ingredient in cocktails would have any appreciable result unless very large doses were taken in this way. Tolerance to the effects of the drug when inhaled regularly is developed quite rapidly, and so long as the inhalations are not being repeated at short intervals the use of amyl nitrite in this way should not cause harm. Inhalation of large doses may cause cyanosis and methaemoglobinaemia, and some patients who are sensitive to the drug develop nitrite syncope even with ordinary therapeutic amounts. Amyl nitrite is not a habit-forming drug.

Ascorbic Acid and Haemopoiesis

Q.—*What is the role of ascorbic acid in haemopoiesis? In what types of anaemia should it be prescribed?*

A.—The exact role of ascorbic acid in erythropoiesis is not known. There is some experimental evidence that ascorbic acid is involved in the metabolism of folic acid and vitamin B_{12}. Anaemia in frank scurvy, however, is either absent or is normocytic; sometimes iron deficiency supervenes as a result of haemorrhage, and very rarely a megaloblastic anaemia is seen. Apart from these anaemias associated with obvious vitamin C deficiency there is seldom any indication for the addition of vitamin C to therapy. A possible exception is the rare megaloblastic anaemia of infancy in which ascorbic acid deficiency may play a part. Many compound tablets of iron and ascorbic acid are on the market. In very large amounts (of the order of 500 g. to 1 g.) vitamin C may enhance absorption of iron, but in small doses its beneficial action is due only to its reducing properties, ferrous iron being more readily absorbed than ferric.

Cervical Gonorrhoea

Q.—*It used to be taught that a diagnosis of gonorrhoea should first be ruled out before chemical treatment for cervicitis is begun. Does the use of the various new chemicals, such as hexetidine, in vaginal gels make the eventual diagnosis more difficult in a previously undiagnosed case of gonococcal cervicitis?*

A.—The gonococcus is easily destroyed by practically any antiseptic, and it is a fair assumption that the local application of hexetidine would make it impossible to find the organism in the genital discharges. The principle remains, therefore, that the diagnosis of gonorrhoea should be excluded by smears and cultures of the secretions before treatment of any infection of the urethra or genitalia.

Intravenous Adrenaline

Q.—*What are the indications for the intravenous injection of adrenaline 1/1,000?*

A.—The principal indication for the intravenous injection of adrenaline 1/1,000 is a sudden fall of blood pressure such as occurs in anaphylactic shock. The injection of adrenaline 1/1,000 is then a life-saving measure. The fall of blood pressure which occurs in anaphylaxis is believed to be due in the main to the release of histamine causing a dilatation of the visceral capillary bed. Adrenaline is the most effective antagonist. Another use of intravenous adrenaline is to reduce the swelling of the tissues at the back of the mouth which occurs after a wasp-sting in the mouth. The dose injected should be 0.2–0.4 ml.

There is a general view that the intravenous injection of adrenaline is dangerous. This probably originates in the fact that it causes ventricular fibrillation when an animal is under chloroform anaesthesia, and it is doubtful whether there is any appreciable risk when chloroform (or cyclopropane or halothane) is not involved. Certainly there can be no appreciable risk when the blood pressure is low. The dose of 0.2–0.4 ml. adrenaline 1/1,000 is tolerated when injected intravenously into a cat.

Corrections.—We regret that in some early copies of the *Journal* of November 15 there was an error in the article entitled "The Isolation of *Trypanosoma rhodesiense* from a Bushbuck," by R. B. Heisch, J. P. McMahon, and P. E. C. Manson-Bahr. In the first paragraph (p. 1203) *Treponema* appeared instead of *Trypanosoma*.

In the article "Hypothermic Myxoedema Coma" by Dr. Donald W. Macdonald (November 8, p. 1144) some doses of L-triiodothyronine were wrongly given in mg. instead of μg. This error occurred in the paragraph headed "1. *Thyroid Hormone*" (p. 1145): all the doses in this paragraph, except that mentioned in line 5, should have been given in μg.

The sentence reading "Of 255 neonatal deaths, respiratory infection was found in 2.3%" in Dr. F. Marsh's second bacteriological study from a maternity hospital (*Journal*, November 15, p. 1204) should read: "Of 255 premature living infants, 6 or 2.3% died of respiratory infection."

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